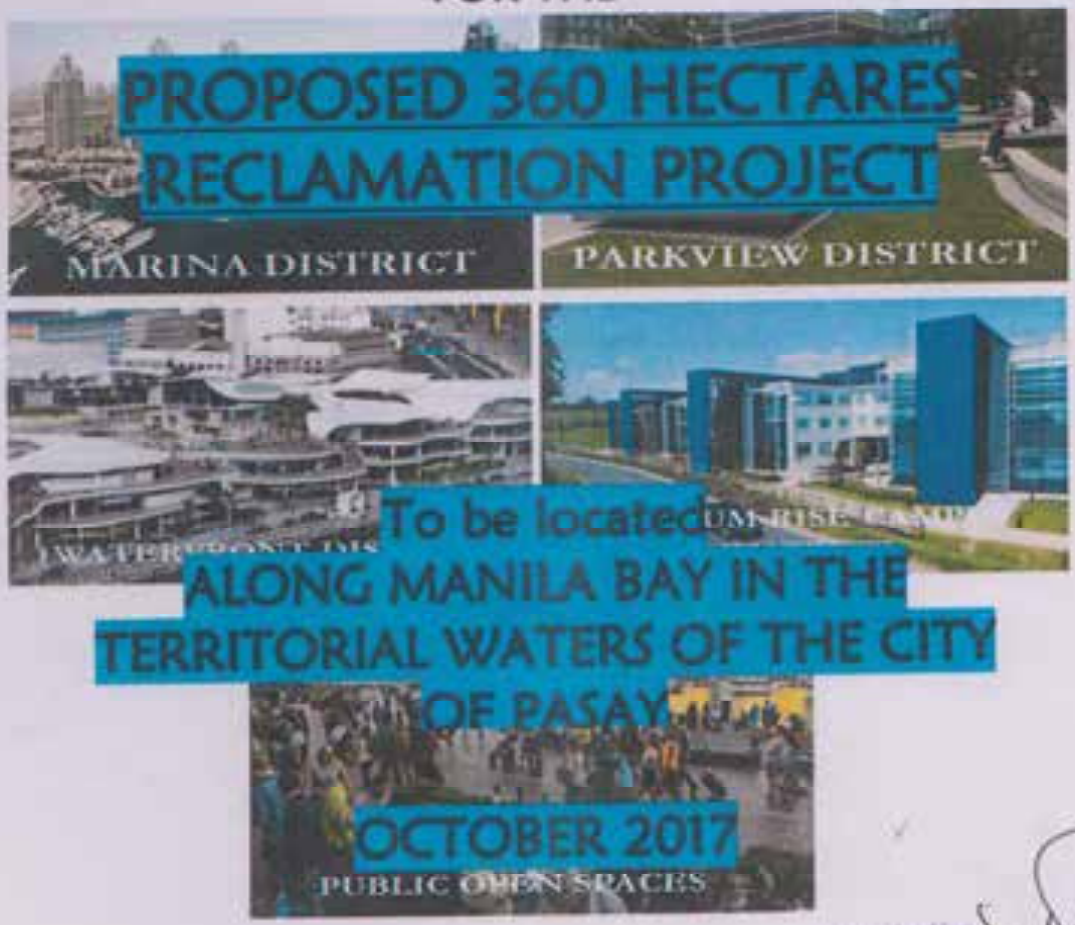
ENVIRONMENTAL IMPACT STATEMENT
(EIS)
FINAL REPORT

FOR THE



PROPOSED 360 HECTARES RECLAMATION PROJECT

To be located

ALONG MANILA BAY IN THE TERRITORIAL WATERS OF THE CITY OF PASAY

OCTOBER 2017

PREPARED BY:

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AND

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SECTION I. PROJECT DESCRIPTION

1.1 Project Location and Area

The project site is within the waters of the Manila Bay along the coast of and within the political jurisdiction of the City of Pasay, National Capital Region.

Location of the 300 hectares Reclamation Project

The 300 hectare reclamation project is fronting the Mall of Asia Complex, the Cultural Center of the Philippines (CCP) and the Financial Center Asia (FCA) beginning from the northern bank of the Redemptorist Channel and up towards the north terminating at the frontage of the Coconut Palace; all being situated within territorial jurisdiction of Pasay City.

Location of the 60 hectares Reclamation Project

The proposed site with a land area of about 60 hectares is fronting the Cultural Center of the Philippines (CCP) and the Financial Center Asia (FCA) beginning from the northern bank of Libertad Channel and up towards north over a span of about 1,290 meters, terminating at the offshore vicinity of the Coconut Palace. In the perpendicular direction towards offshore of the Manila Bay the site will measure up to, more or less, 390 meters. At this point, the edge of the reclamation will directly align with the existing seawall of the Central Business Park 1- A and the other reclaimed lands in the southern portion of the Boulevards 2000 Project. The land form is almost rectangular in shape measuring approximately 1,290 m x 300 m.

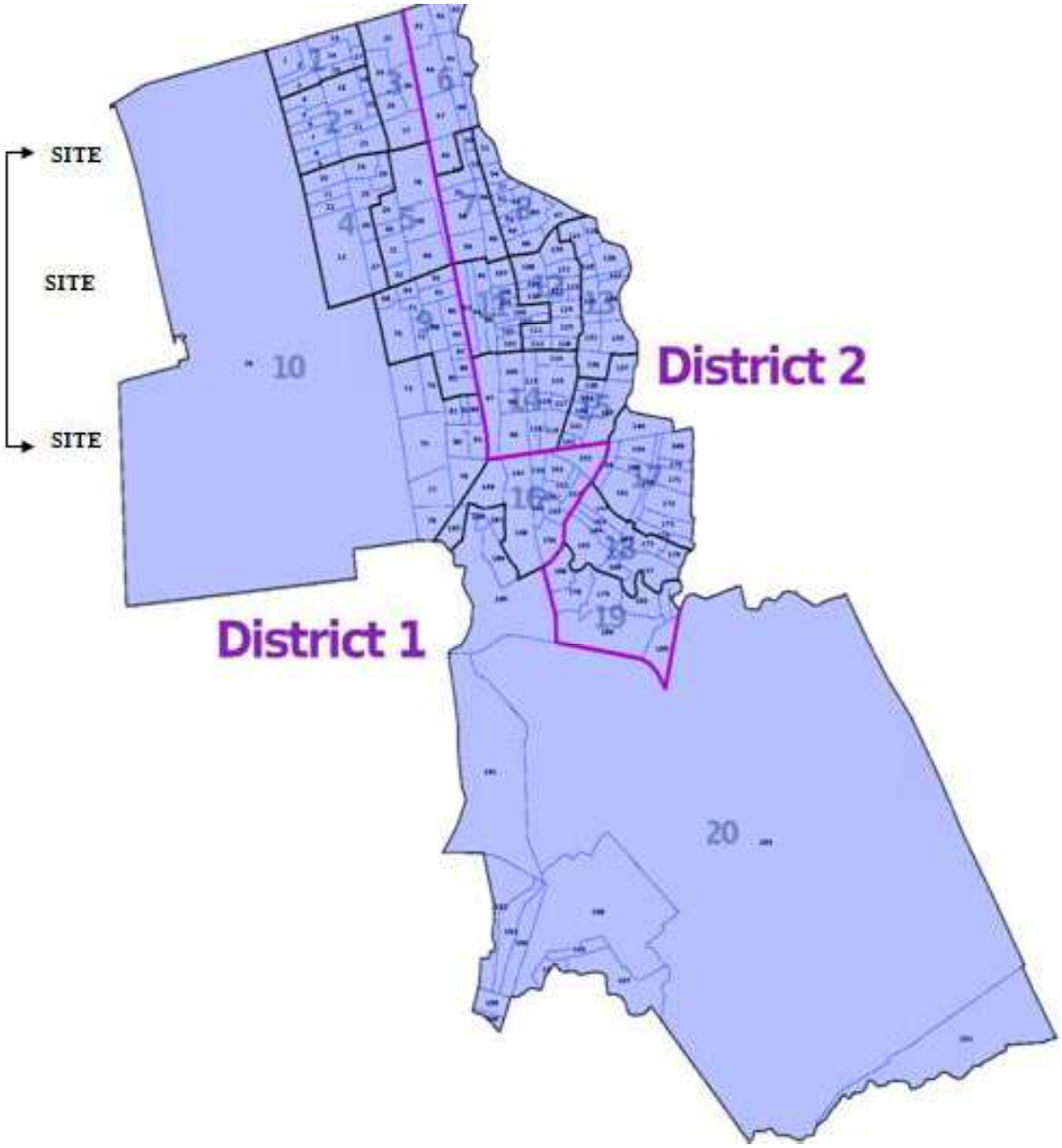
Figure 1.1 shows the location of these two (2) reclamation areas.



Figure 1.1 Project Location showing the vicinity of the Project Site

1.1.1 Map showing sitio, barangay, municipality, province, region boundaries, vicinity, proposed buffers surrounding the area and Primary & secondary impact areas.

These geographical/political maps are shown in **Figures 1.2, 1.3** and **1.4** while the map of the primary and secondary impact areas and proposed buffers is given in **Figure 1.8**. **Figure 1.5** shows the other proposed reclamation projects in Manila Bay adjacent to the project.



(Source:http://wiki.openstreetmap.org/w/images/thumb/6/6f/Pasay_boundaries.png/953pxPasay_boundaries.png. August 2014)

Figure 1.2 Map Showing the Barangay Boundary



*(**SOURCE:** BF Homes Properties. Metro Manila Map. http://www.bfhomes.net/metro_manila_map.htm. Retrieved on August 2014)*

Figure 1.3 Map showing the City Boundary



SOURCE: *2011 Comprehensive Land Use Plan (CLUP) of Pasay*

Figure 1.4 Map showing the Location of Pasay City Relative to Metropolitan Manila



Figure 1.5 Map indicating the other proposed reclamation project adjacent to the Pasay Project

The Reclamation Project of the City of Pasay
Existing reclamation projects adjacent to Pasay
PRA targets and linked projects (ex. San Nicholas Shoal Dredging Project)

Based from the existing Comprehensive Land Use Plan (CLUP) the city has a total area of 1,805.11 hectares. The city proper or Barangays 1 to 201 occupies around 1,399.50 hectares or 77.53% the total area. The Cultural Center Complex occupies around 191.95 hectares (10.63%) while the rest of the area 213.66 hectares (11.84 %) represent the existing reclaimed area.

There are at least six (6) distinct subdivisions of land and water areas in the present-day plan. The City has a basically reflective history of settlements that evolved within the city over the past 100 to 150 years wherein reclamation area can be noted. These are as follows:

- The Original Settlement Area (OSA)
- **The Old Reclamation Area (ORA)**
- The Original Villamor Air Base Area (OVABA)
- The Airport Area (AA) which was developed mainly between 1950 and 1980;
- **The New Coastal Reclamation Area (NCRA)**
- **The City Waters Area (CWA)**

- **On the Old Reclamation Area (ORA)**

The Old Reclamation Area (ORA) which was largely settled between 1900 to c. 1950.

Facilities catering to higher order urban functions within the ORA, e.g., five (5)-star hotels, huge mixed-use developments, dining/ entertainment establishments and gaming places, existing and proposed commercial and business centers, metropolitan hospitals and the like, are generally dated and of comparatively smaller sizes/ of less capacities than those found elsewhere in the Metro Manila Area (MMA) and these factors have generally reduced their competitiveness as city and metropolitan destinations.

New / upgraded commercial developments within the ORA need to be supported but strictly monitored because of their effects on utilities and infrastructure, traffic and the environment in general. These should be generally confined to all circumferential, radial and collector roads within the ORA.

- **On the New Coastal Reclamation Area (NCRA)**

The New Coastal Reclamation Area (NCRA) which was developed possibly between 1950 and the present.

The Boulevard 2000 Project within the NCRA is a high-density development that will create a new development focus for the entire MMA and even the northern CALABARZON area. Upon partial and substantial development, it will definitely alter travel patterns in the MMA particularly in Pasay City and Paranaque City. By year 2010, initial conservative estimates of transient daytime population within CBP-I (A) alone may reach 150,000 – 250,000 which is comparable with Pasay City's present-day residential population. By year 2030, initial conservative estimates of transient daytime population within CBP-I (A) alone may reach 700,000 –750,000 which is about thrice Pasay City's present-day residential population. The traffic and waste generation that will be generated by these transient populations, not to mention the need to satisfy their utility and support requirements will constitute a huge infrastructure and logistical burden for Pasay City.

Some of the facilities catering to higher order urban functions within the NCRA, e.g., the CCP, the old FAT, the PICC, DTI-PTTC, five (5)-star hotels, the Philippine Senate/ GSIS head office, PNB financial center complex, existing commercial and business centers and the like, while comparatively larger in area and capacity are all generally dated compared to those found elsewhere in the MMA and these factors have generally reduced their competitiveness as metropolitan destinations.

Its key disadvantage lies in the artificial ground structure which is not cost-efficient as far as structural foundations are concerned. This makes construction in the NCRA the second most expensive than elsewhere in Pasay City, with the exception of the CWA. Another key disadvantage is the lack of a good domestic water source in the area.

The important locators-landowners in the CC-FCA portion of the NCRA are as follows:

- The Cultural Center of the Philippines (CCP);
- The Tanghalang Francisco Balagtas (former Folk Arts Theater);
- The Westin Philippine Plaza Hotel;
- The Philippine International Convention Center (PICC);
- The Film Center;
- The Government Service Insurance System (GSIS) Headquarters Office cum Philippine Senate;
- The Philippine National Bank (PNB) Financial Center;
- The World Trade Center;
- The Department of Trade and Industry (DTI) - PTTC Complex;
- The Coconut Palace;
- The Social Security System (SSS), lot only;
- The Philippine National Construction Corporation (PNCC), lot only;
- The Land Bank of the Philippines (LBP), lot only.

The CBP-I (A) portion of the NCRA now has the following key locators-landowners:

- The Metrobank Group with its Toyota Manila Bay Showroom cum service center, several high-rise residential condominiums presently under construction and a proposed general hospital complex, all forming part of a medium-intensity/density mixed use development;
- The SM Group with its Church of the Way, the Truth and the Life and its proposed Mall of Asia Project, all forming part of a very high intensity/ density mixed use development; and
- The Public Estates Authority (PEA) with about 50.0 hectares of high-intensity/ density mixed use developments.

- **On the City Waters Area (CWA) - The City Waters Area (CWA) which is the present off-coastal portion of Pasay City at Manila Bay.**

The City Waters Area (CWA) is the present off-coastal portion of Pasay City at Manila Bay and extends from the seawall of the NCRA up to approximately 300 – 400 meters offshore. There is still future potential for additional reclamation in this area.

- **On the Boulevard 2000 Project**

The entire 1,500 hectares Boulevard 2000 Project, generally classified as a Planned Unit Development (PUD), i.e., of which the CC-FCA and CBP-I (A) portions of the 330 has. NCRA are part, is a high-density cum high intensity development that will create a new development focus for the entire MMA and even for the northern CALABARZON area. Upon partial and substantial development, it will definitely alter

travel patterns in the south MMA particularly in the Pasay City and Paranaque City areas.

If the intended Boulevard 2000 developments gradually materialize over the next 10 - 50 years, Pasay City must be ready for its long-term effects (positive initially but which may turn out to be negative in the end). Since the Boulevard 2000 Project seems to be planned, implemented and which may possibly be operated relatively independent of Pasay City, the Pasay City LGU must again be able to determine its available options in determining the pace and quality of developments at the Boulevard 2000 Project areas within Pasay City. **Figure 1.12** shows the scope of the Boulevard 2000 Project.

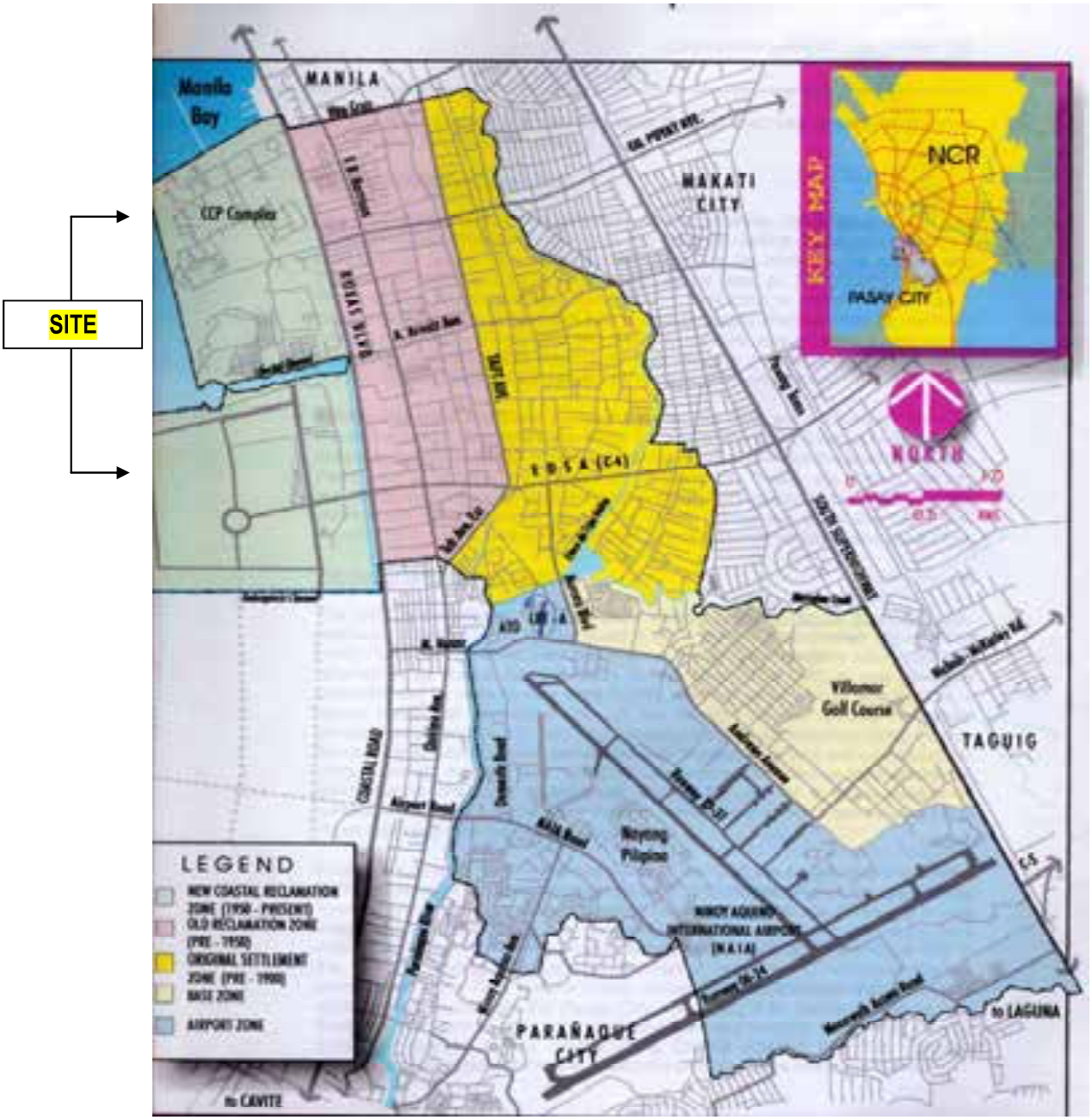


Figure 1.6 Land Uses in Pasay based from Pasay City CLUP

- **PRA TARGETS AND LINKED PROJECTS**

Based from the National Reclamation Plan (NRP), the Philippine government has given the go signal to the Philippine Reclamation Authority (PRA), to engage in massive land reclamation all over the country through Public-Private Partnerships (PPP) with the adoption of the Philippine Reclamation Authority Resolution 4161 (Approval of the National Reclamation Plan) on February 25, 2011. Under the National Reclamation Plan, the Aquino government will undertake 102 reclamation projects covering 38,000 hectares of foreshore areas.

Thirty eight (38) of these reclamation projects encompassing 26,234 hectares, or 70% of target scope of reclamation will be implemented in Manila Bay. These will cover several coastal towns of Cavite province (Cavite City, Tanza, Noveleta, Rosario, Kawit and Bacoor City), coastal cities of Metro Manila, and coastal towns of Bulacan, Pampanga and Bataan in the Central Luzon region.

Accomplished Reclamation Projects (http://www.pea.gov.ph/index.php/programs-and-projects/reclamation)

Manila Bay: Bay City Reclamation Project (formerly Boulevard 2000)

This project, located in the cities of Pasay and Parañaque, is composed of the following island reclamation:

- Central Business Park I-A
- Central Business Park I- B & C
- Central Business Park II
- Asia World



- **Central Business Park I - A (CBP I-A)**

CBP I-A covers an area of 200 hectares. It is entirely located in the City of Pasay, contributing more than 10% to the city's former land area of 1,900 hectares. The major land owners are the SM Group, the Metrobank Group of Companies, and the PRA.

The Shrine of Jesus is the first landmark built in the area. Across it is the Mall of Asia which was opened in May 2006. The mall, one of the largest in Asia, spans a floor area of 386,000 square meters. With SM by the Bay, the Mall of Asia complex is possibly the largest single attraction in the entire metropolis. It has daily visitors reaching 100,000 and it employs more than 6,000 Pasay City residents. CBP I-A is also home to Mall of Asia Arena, an ultra-modern events venue with a full-house capacity of 20,000 and facilities of NBA standard.

The Metropolitan Park, owned by the Metrobank Group of Companies, is the home of Manila Tytana Colleges (formerly Manila Doctors College), Toyota Manila Bay Corp., Le Pavilion, Metrobank Branch, Bay Garden Condominiums, Petron Gas Station and Blue Wave, a complex of restaurants and commercial establishments.

A prominent part of CBP I-A is an esplanade adjacent to SM by the Bay. It is the new preferred recreation area for the public where people can freely access a view of the sea and of the famous Manila Bay sunset.

- **Central Business Park I - B & C**

  A joint venture of PRA and R-1 Consortium, CBP B & C cover 210 hectares of reclaimed land. Bordered on the north by the Redemptorist Channel and Mall of Asia Arena in CBP I-A, and in the south by the Seaside Channel CBP-II and the Manila Bay Town Subdivision, the project stretches across the shoreline of Manila Bay with approximately 1.2 kilometers offshore with an approximate perpendicular distance of 1.5 kms.

  Part of CBP B & C is PAGCOR's Entertainment City where Solaire Resort & Casino stands. Opened in March 2013, Solaire Resort & Casino provided 4,600 managerial and entry-level jobs for Filipinos.

  Currently, CBP B & C is fast-becoming the new central business district of the City of Parañaque.

- **Central Business Park II**

  Entirely owned by Manila Bay Development Corporation, the 43-hectare area is home to Uniwide Coastal Mall and Metro Manila Development Authority's Southwest Integrated Provincial Transport Terminal.

  The bus terminal operates 24-hours a day and dispatches 900 buses that serve approximately 54,000 passengers every day. It is part of a centralized, intermodal and integrated bus terminal system which aims to improve the mobility of people and the traffic situation within the road networks of Metro Manila. (http://www.president.gov.ph/news/aquino-inspects-major-terminals-in-metro-manila/)

- **Asia World**

  This 173-hectare property, owned by the Tan Yu family is now a residential complex with infrastructure facilities already in place.

- **Cultural Center of the Philippines**

  The 77 hectare CCP Complex is under the jurisdiction of two cities, Manila and Pasay. Along the Roxas Boulevard, the complex is divided into two zones, an Art Zone and a Commercial and Entertainment Zone. The general objective is for the Commercial Zone to generate income that would subsidize the Art Zone. Current locators in the area aside from the CCP are the Manila Film Center, Folk Arts Theatre, Philippine International Convention Center, Philippine Plaza Hotel, Coconut Palace, Ferry Terminal and Star City among others.

- **National Reclamation Plan Project List**

SECTOR	No. of Projects	COVERAGE	Total Area (has.)
Manila Bay	38	Cavite to Bataan	26,234.00
Visayas	7	Mactan Channel from Talisay to Minglanilla, Cordova, Lapulapu and Mandaue Cities &Consolacion	6,000.00
Mindanao	7	Davao Gulf	238.00
Others	50	Various	5,800.00
TOTAL	102		38,272.00

(http://reclamationforwhom.files.wordpress.com/2012/09/nrp-project-list.pdf. Retrieved on August 2014)

MANILA BAY RECLAMATION PROJECTS				
LOCATION	ITEM	PROJECT TITLE	STATUS	TOTAL AREA
Navotas	MB-N11	Navotas Business Park Reclamation Proj	Proposed	650.00
Manila, Tondo	MB-N10	R-II Builders Manila Harbor Center	Proposed	50.00
Manila, Tondo	MB-N09	PRA Oil Depot and Business Park	Proposed	190.00
Manila, Ermita	MB-N08	Project Area	For Planning	233.84
Manila, Malate	MB-N07	Project Area	For Planning	98.38
Makati	MB-N06	Project Area	For Planning	717.03
Pasay	MB-N05	Project Area	For Planning	301.71
Paranaque	MB-NO4	Project Area	For Planning	398.61
Paranaque/Las Pinas	MB-NO3	Paranaque-Las Pinas Coastal Project	Proposed	635.14
Las Pinas	MB-NO2	Project Area	For Planning	503.13
Paranaque	MB-NO1	Project Area	For Planning	159.13
		NCR	11.00	3,936.97
Bacoor	MB-S01	MCTE Reclamation Project		844.12
Bacoor	MB-S02	Cavite Reclamation Project Special Economic Zone		68.00
Cavite City	MB-S03	Phil Navy Reclamation Project		60.00
Rosario	MB-S04	Sangley Point Development Project (SPDP)		2,700.27
	MB-S05	Project Area		227.89
	MB-S06	Project Area		713.90
	MB-S07	Project Area		401.77
	MB-S08	Project Area		595.70
	MB-S09	Project Area		569.95
	MB-S10	Project Area		279.96
	MB-S11	Ternate Reclamation Project		30.00
		CAVITE	11.00	6,491.56
Malabon-Obando	MB-N12	Project Area		1,317.11
Bulacan, Malolos, Paombong, Hagonoy	MB-N13	Project Area		2,104.28
	MB-N14	Project Area		2,044.08
	MB-N15	Project Area		603.79
	MB-N16	Project Area		822.49
	MB-N17	Project Area		767.09
Lubao-Sasmuan-Masantol	MB-N18	Pamparga Bay Integrated Development		4,057.89
Bataan	MB-N19	Project Area		2,054.23
		BULACAN-Pampanga-BATAAN	8.00	13,770.96
Cavite	MB-PAO1	Relocation of Manila South Harbor	For Planning	906.31
Tondo, Manila	MB-PAO2	Relocation of proposed airport @SPDP	For Planning	1,128.32
		Missing 6 other projects (FROM REPORTED TOTAL OF 38 PROJECTS		
			MANILA BAY TOTAL	26,234.12

SOURCE: (http://reclamationforwhom.files.wordpress.com/2012/09/nrp-project-list.pdf. Retrieved on August 2014)



Figure 1.7 Reclamation Projects in the entire Philippines

The San Nicholas Shoal Dredging Project of the PRA

By virtue of Executive Order No. 153, the Philippine Reclamation Authority (PRA) is authorized to utilize offshore areas as sources of dredge fill materials for government reclamation projects. The DENR subsequently issued a Government Seabed Quarry Permit (GSQP) giving PRA clearance to develop, extract and dispose marine aggregates from the San Nicolas Shoal borrow area, in the province of Cavite, covering an area of 10,000 hectares. Prior to the issuance of the GSQP allowing PRA to utilize San Nicolas Shoal, it was made certain by both DENR and Bureau of Fisheries and Aquatic Resources (BFAR) that quarrying activities in the area will not affect the existing spawning/breeding grounds of marine life in the area. It was observed that at the time the application for permit was submitted, coral reefs in the area were minimal due to the lack of seagrasses that can sustain it. *(Source: Primer on Reclamation by the Philippine Reclamation Authority)*

An application for an Environmental Compliance Certificate (ECC) is now in process with the EMB Central Office

Locating the Project Elsewhere

This idea expressed during the Public Hearing is not legally nor technically feasible because the proponent -the City of Pasay, can only establish this project within its territorial boundaries.

1.1.2 Geographical Coordinates of the Project Site (Shape file using WGS 84 datum - GPS setting)

Table 1.1a 300 Hectares Geographical Coordinates

300 Hectares (WGS 84)	
of Corner	**Coordinates**
1	14^0 31' 47.72633" N 120^0 58' 38.01372" E
2	14^0 31' 46.16931" N 120^0 57' 59.37069" E
3	14^0 32' 25.10246" N 120^0 57' 57.88073" E
4	14^0 33' 05.89682" N 120^0 57' 46.26549" E
5	14^0 33' 15.70192" N 120^0 58' 22.56439" E
6	14^0 32' 26.65958" N 120^0 58' 36.52564" E

Table 1.1b 60 Hectares Geographical Coordinates

60 Hectares (WGS 84)	
Corner	**Coordinates**
1	14^0 32' 48.38350" N 120^0 58' 53.07111" E
2	14^0 32' 36.99293" N 120^0 58' 40.51704" E
3	14^0 33' 17.44084" N 120^0 58' 29.00262" E
4	14^0 33' 20.83158" N 120^0 58' 41.55726" E

1.1.3 The Primary and Secondary Impact Areas

Rationale for Primary and Secondary Impact Areas
Segregation of the primary and secondary impact area for bio physical from social impact areas (tabulate and mapped out)

The guidelines provided by the Revised Procedural Manual relevant to this project are used for the delineation of the DIA and IIA, to wit:

a) Direct impact area (DIA) is … **"*the area where ALL project facilities are proposed to be constructed/situated and where all operations are proposed to be undertaken,….For most projects; the DIA is equivalent to the total area applied for an ECC*."**

b.) Indirect Impact Area (IIA) …**"*an IIA can be the stretch of the river/s OUTSIDE the project area but draining the project site which can potentially transport Total Suspended Solids and other discharges from the project towards downstream communities*."**

c.) …Further, the interphase/overlap of the biophysical DIA with socio-cultural environment shall define the socio-cultural DIA after the EIA is completed…

d.) The Indirect Impact Area (IIA) is clearly delineated only after the EIA Study is done, and is more accurately established during post-ECC monitoring.

On the basis of the above guidelines the DIA and IIA the following delineation is made.

The Physical Impact Areas/The Direct Impact Area (DIA)

- **<u>The Direct Impact Area (DIA)</u>**

The activities during the construction phase will be essentially confined at sea and not on land. The on-shore activities will involve the small scale construction of access roads. Thus, the locality or the communities on land near the site will not be significantly affected. Even the transport of the filling materials will be confined at sea inasmuch as these materials will be most likely sourced from San Nicholas Shoal in Cavite.

In addition, the proposed project will provide containment sheets or silt curtains surrounding the perimeter of the reclamation area/construction sites to prevent dispersal of silts/sediments to outside the project boundaries. This further explains why the DIA is essentially confined to project site.

On the other hand, portion (i.e. the mouth) of the Libertad Channel is regarded as a DIA because of the importance of the channel to flood mitigation. This portion is its mouth since this is towards the 300-hectare reclamation configuration with a 200 m wide channel separation. The Design and Engineering Details (DED) post ECC will ensure that the reclaimed land will not block nor impede the circulation of the discharge from the mouth of the channel that flooding or poor water circulation may occur.

In addition to DIA, the site for the disposal of the dredged out unwanted bed materials is still to be determined. Firm engineering details need to be undertaken so that the volume and timing for this disposal can be established. Trash, scrap materials, debris and other solid wastes at the sea bed will be disposed on land through a third-party disposal firm. Separate clearances may be needed for the disposal of unwanted sea bed materials in case this may be done outside the project area.

- **The Indirect Impact Area (IIA)**

  The access roads to the site are considered in the IIA because transport of certain construction crew, materials and equipment for the construction phase may use roads i.e. the Diokno highway and road alongside the Film Center. This use may be limited/sparing because most of the equipment is sea based and are transported by barges.

  Other identified IIA is the neighboring establishments, buildings and structures that may have on considerations of (i) allegations / claims that the structures / buildings to be constructed on the reclaimed land may obstruct the scenic views of the Manila Bay (ii) potential conflict with the commercial plan(s) in the areas adjacent to the project site.

  The IIA of the proposed project also considers the impacts arising from barging/sea transport by the dredging contractor. The consideration to this relates to potential disturbance or risk to the fish cages along the navigational lane near Cavite. These fish cages could likely be at risk during events of strong typhoons. The mitigating measures that the proponent will strictly impose on the dredging contractor are as follows:

  a. Use of sea worth vessels approved by the Philippine Authorities, e.g. the Philippine Coast Guard.
  b. Installation of adequate navigational instruments including early warning systems.
  c. Training of vessel crews and personnel.
  d. Stoppage of vessel transport during inclement weather conditions.
  e. Securing of acceptable marine and related insurance coverage.

  The above measures, at the minimum, will be included in the contract that the proponent will enter into with the dredging company.

- **The Social Impact Area (SIA)**

  The SIA considers both the positive and adverse/perceived negative impacts of the project. Thus, the entire City of Pasay is taken as SIA because the benefits extend to the entire city in terms of employment and livelihood opportunities, taxes paid and a rare opportunity for acquiring land for development purposes without financial requirements. The Honourable Mayor Antonino Calixto spelled out the vast benefits to the residents of the project during the Public Hearing. The hiring of approximately 2,116,800 employees was also stated during the Hearing (See **Annex 14**).

  Other SIA identified are the few fisher folks operating in the Manila Bay waters within Pasay City but outside of the project site. A fishermen's wharf was mentioned as one of the projects of the City during the operations phase of the project.

  A tabulation summarizing the DIA IIA and SIA is shown in **Table 1.2.**

Table 1.2 Summary of the Rationale for Choice of Site of the Major Considerations Thereof

Rationale/Considerations	Impacts	Sites/Impact Areas
Direct Impact Area		
Natural Risks (Floods)	Perceptions of Flooding Caused by the Project	Libertad Channel From Its Discharge Mouth to the sea
Impact on Manila Bay	Change in water form	300 and 60 hectare land created
	Potential for Silt Dispersal	To be confined to within and immediate vicinity of the

Rationale/Considerations	Impacts	Sites/Impact Areas
		project sites
Indirect Impact Areas		
Access Road	Traffic	Nearest roads to Site
Business Competition	Competition with Small Establishments	Current location of small establishments
Navigation of Dredging Vessel	Oil Spills Potential Damage to fish cages	Along the navigational lane to San Nicholas Shoal Near the Cavite area
Social and Perceptions (Social Impact Areas)		
Access to Fishing Grounds	The significant fishing grounds are outside the project site. There are insignificant fish populations within the site itself.	As stated in Column 2
Perceptions of Floodings	Exacerbation of Floods	Portion of the Drainage System which are outside the project site
Fisherfolks and Small Businesses Along Manila Bay	Competition Loss of Place of Business or Livelihood	Along the Bay walk near the Manila Yacht Club

Note: The term "perception" is used in reference to flooding because there are no evidences that the existing reclamation projects in Pasay have in reality caused flooding.

The map of the Impact Areas and of the Buffer Zone is shown in **Figure 1.8.**

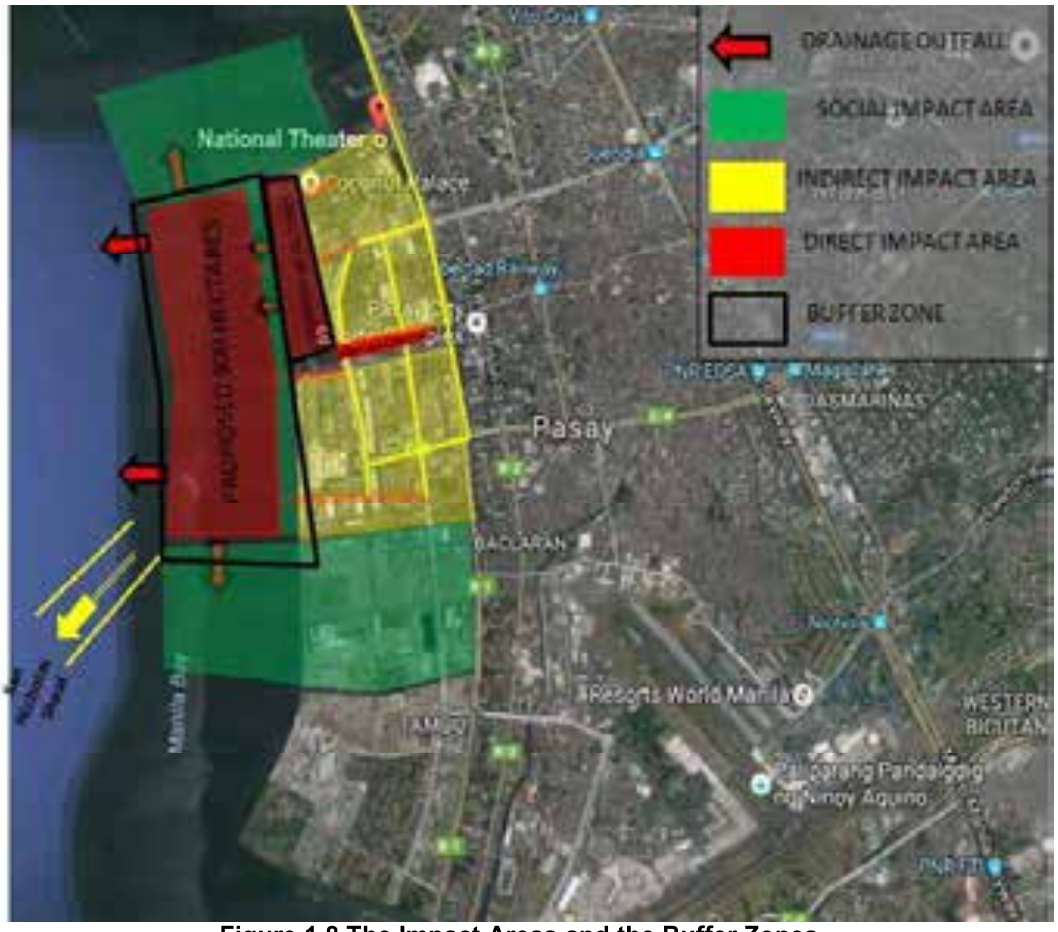


Figure 1.8 The Impact Areas and the Buffer Zones

1.1.4 Accessibility of the Project Site/ Area

The plan for access to the sites is shown in **Figures 1.9** and **1.10.** Shown in this map are some of the important landmarks adjacent to the project site such as:

- Coconut Palace,
- Sofitel Hotel,
- Mall of Asia and
- Government buildings, e.g. the Senate

The site of the proposed reclamation may be accessed by possibly extending Sen. G. Puyat Avenue from the eastern side that connects directly with J.W. Diokno Boulevard and the major road systems of Metro Manila, namely: the President Diosdado Macapagal Boulevard (PDMB), Epifanio Delos Santos Avenue (EDSA) Extension and Roxas Boulevard 2000 Project, which lies parallel to PDMB and Roxas Boulevard, may be tapped as one of the possible major access toward the area.

Accessibility of the project site to the source of dredge filling materials

With regards the proposed project which only involves land reclamation, the accessibility of the project site to and from the source of dredge fill materials is given due consideration.

Dredge fill materials abound in the PRA offshore burrow area at the San Nicolas Shoal (SNS) which has a deposit of 300 million cubic meters and which replenishes on its own through time. Shown in **Figure 1.11** is the location of the SNS relative to the project.

An alternative source to the SNS is the lahar deposit in Pampanga and Zambales which can be transported to the proposed site by barges via Manila Bay to attain economies of scale. Other sources will be further evaluated.

The SNS is barely an hour travel time to the project site while the Pampanga and Zambales areas may take some 3 hours to haul the lahar materials to the project site.



Figure 1.9 Map Showing Accessibility to the Site and the Major Road Systems Near the Site



Figure 1.10 Map indicating the immediate vicinity and nearest existing road near the Proposed Project



Figure 1.11 Map indicating the distance of San Nicolas Shoal to the Project Site

1.2 Project Rationale

The immediately obvious consequence of a "No Project Scenario" is that the City of Pasay will be denied of its ability to pursue further and full development with its attendant and important impacts of livelihood and employment generation.

Currently, there are no available lands for future development in Pasay; most of it is already built-up and developed. Pasay City has only a total land area of 18.5 square kilometers. The city proper or Barangays 1 to 201 occupies around 1,399.50 hectares or 77.53 percent the total area**.** With the given limited total land area, the total number of population of Pasay City is about 363,000 in the year 2000. Hence, the city of Pasay was among the most congested localities in NCR with a population density of 25,533 in 2000 (See **Section 2.4**). As perceived solution, one positive thing going for the city is that it is not land-locked; it has its own bay front presenting opportunities for further land expansion through **reclamation.**

The proposed land reclamation project can produce some 2,520,000 square meters (See **Table 1.4**) of additional buildable/developable space; this can enable the City of Pasay to further expand its own world class tourism, entertainment, commercial and business district in the coming years. The expanded reclaimed areas will provide the sufficient critical mass and synergy to enable Pasay City to compete with and surpass other business districts existing within Metro Manila.

The proposed reclamation project can be translated into floor area of about 2,520,000 square meters in the coming years. This means that there will be additional buildable land that can produce some 15,120,000 square meters of building gross floor area (based on an average floor area ratio of 6), which can be allocated for office, residential, commercial, and mixed uses. These can be translated of about 2,116,800 new employees, workers and residents in Pasay City thereby spurring economic growth through increased business activities in the coming years.

The benefits that shall accrue to the to the City of Pasay will be substantial and these will be in the form of additional income and revenues generated from additional real estate taxes, permits and licenses and business taxes, not to mention the employment opportunities that will be opened up to the residents of Pasay City.

Further, in "No-Project Scenario", the massive economic and social development plans for the City accompanying the reclamation project as pronounced by the City Mayor during Public Hearing (**Annex 14**) will be frustrated.

Environmental Consequences (*With or a Without Project Scenario)*

The operationalization of the reclamation project will provide the much needed funds in support of environmental initiatives of the city, starting with support of the "Continuing Mandamus" (See discussion on consistency of the proposed project with the other plan) during the Operations Phase. More enhanced management of the City's wastes may be achieved from the funds generated from the project.

In addition, the statement of the mayor regarding providing fishermen's wharf could also be jeopardized.

On the other hand, in the absence of such marine life in the project impact areas, a *With or a Without Project Scenario* will not impact on the marine resources at the impact areas. Mangroves are likewise absent at the site and immediate vicinities.

Concerns for Hazards (*With or a Without Project Scenario)*

With or Without the project, met-ocean hazards (storm surges and tsunami) could still occur. The *"Without Project"* scenario will deny the areas / communities near the site with "sheltering" protection from the reclamation structure and wave deflectors.

Instead the use again of palliative measures such sandbags as provided in the foregoing discussion.

Earthquake vulnerabilities, Ground Subsidence, Liquefaction and Flooding are not affected by existence or not of the Project. **(*With or a Without Project Scenario)***

Seismic-related hazards are neither caused nor exacerbated by the presence or absence of the project. Flooding which is occasioned generally by poor drainage system upstream of the project site is also not germane to the proposed project. Further, the serious problems of land subsidence which is attributable to ground water extraction will not also have causative relevance to the project.

Alternative Uses of the Reclamation Area (*With or a Without Project Scenario)*

There does not appear to be alternative beneficial use of the reclamation area for

- Source of Food from Fishes and Marine Species
- Port Operations
- Navigational Lanes
- Recreation (swimming, sports activities, etc).

Consistency with the other plans (compatible with (a) PRA implementing rules and regulations, (b) DENR Manila Bay Coastal Strategy and its Operational Plan, (c) Pasay City CLUP rules and regulations, (d) Continuing Supreme Court Mandamus on Manila Bay, (e) PRA Boulevard 2000 Integrated Framework Plan) pertaining to reclamation.

The proposed project is consistent with and in support of the Philippine government's (through the Philippine Reclamation Authority) vision to develop reclamation projects. (This Section is comprehensively discussed in **Section 2.1.1 page 2.1.-10 to 2.1-17.)**

In particular, it is in support of the:

- **PRA Boulevard 2000 Integrated Framework Plan**
    - The proposed project is consistent with the PRA's Master Plan for the Manila Bay Sector (MBS) and of the Boulevard 2000 Vision. (**Figure 1.12** shows the PRA's Master Plan).
- **PRA implementing rules and regulations**
    - All reclamation project proposals undergo a stringent 5-stage approval process by the PRA. These include securing an **Environmental Compliance Certificate (ECC)**, submission of flooding and drainage studies, public consultations by the proponents, detailed engineering designs, geo-hazard assessment as well as financial feasibility studies. No reclamation works can commence without a Notice to Proceed (NTP) being issued by the PRA.
    - **Republic Act No. 7160 or the Local Government Code** - authorized provinces and cities to fund and undertake reclamation projects to service the needs of their residents

- The applicant shall file with the PRA a letter of intent or application to undertake a reclamation project together with the requirements.

- **Local Government Unit (LGU) /Other Government Agency (OGA)**

  - Board/Council Resolution authorizing LGU/OGA to file an application with PRA (Provided in **Annex 3a and 3b**).

  - Certified true copy of the charter or other incorporation documents.

- **In support with Pasay City CLUP rules and regulations** wherein

  - The City Waters Area (CWA) based from the existing CLUP of Pasay is the present off-coastal portion of the City at Manila Bay and extends from the seawall of the NCRA up to say 300 – 400 meters offshore. There is still future potential for additional reclamation in this area.

  - Resolution No. 4373, which the proposed project with an aggregate area of about 300 hectares more or less, located along Manila Bay within the jurisdiction of Pasay City, is adopted as a priority project **(See Annex 3a).**

  - Resolution No. 4234, that the proposed project of Pasay City Government with an area of about 60 hectares within its territorial jurisdiction is approved and subject to strict compliance with pertinent laws, rules and regulations. **(See Annex 3b).**

  - There are also no issues in respect of land classification since the site is consistent with the CLUP of the City and the City itself approved the project as seen in **Figure 1.13.**

- **DENR Manila Bay Coastal Strategy**

  Harmonization of the Project with the Manila Bay Coastal Strategy (MBCS) in respect with the MBCS framework of cooperation among the LGUs and other entities on common areas of social concern.

- **Continuing Supreme Court Mandamus on Manila Bay**

  The matters of the MBCS and the Continuing Supreme Court Mandamus are comprehensively discussed in **Section 2.1.1 page 2.1-15.**

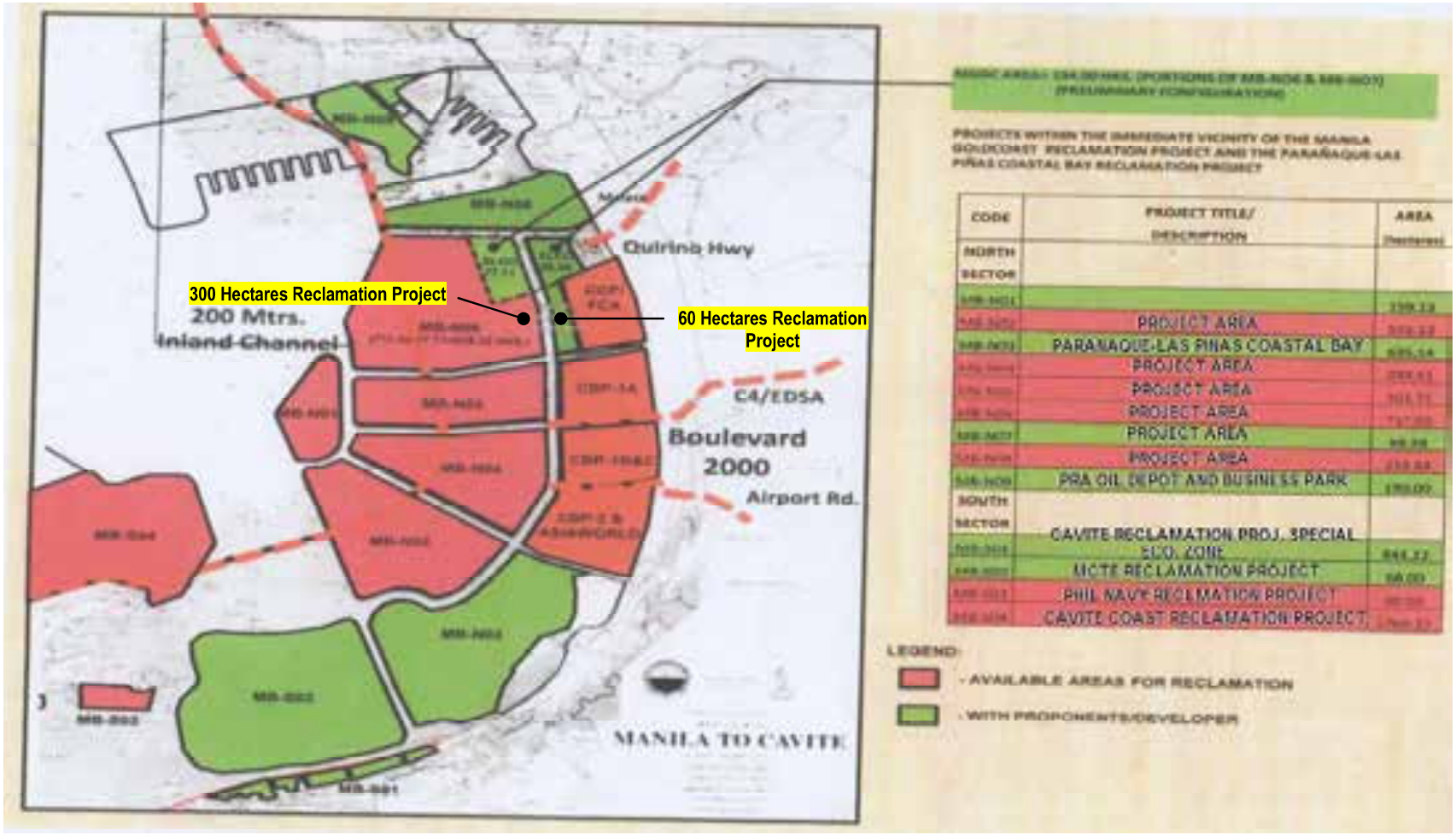


Figure 1.12 The Boulevard 2000 Master Plan of the Philippine Reclamation Authority

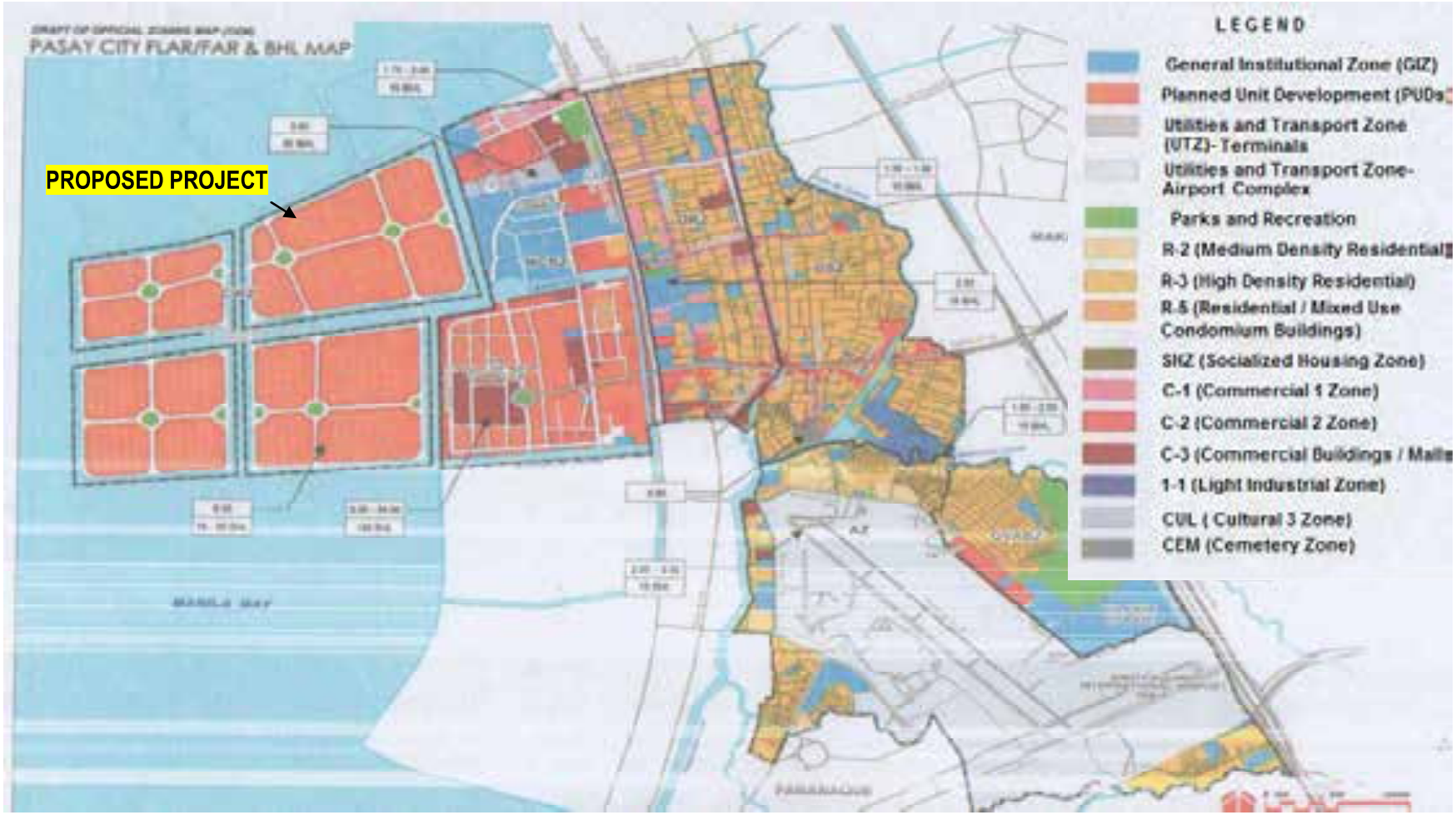


Figure 1.13 2013 Draft of Official Zoning Map / OZM of Pasay

The need for the based on national and regional/local economic development in terms of contribution to sustainable development agenda or current development thrusts and Justification for the Project with particular reference made to the economic and social benefits, including employment and associate economic development, which the project may provide.

In this respect, the project will also serve to:

- Stimulate commercial growth by providing a basic infrastructure, namely land to investors thus will promote the well-being of the people of the City of Pasay and adjacent communities in terms of employment and livelihood opportunities, thus alleviating poverty.

- Provide direct and indirect employment and livelihood opportunities. Direct benefits are employments at the project site itself while indirect employments refer to services and goods provided from outside the site such as but not limited to:

  - Transportation services which employ drivers, helpers, maintenance mechanics.
  - Employees and laborers needed for the production or creation of goods to be sold in commercial establishments to be located at the project site.

Several other linkage effects include:

- Help in decongesting Metro Manila and the City of Pasay by providing alternative site for future development such as commercial/mixed-use property project developments instead of such developments being located in the already-crowded inland.

- Provide a viable alternative to the portion of the Manila Bay which will be the reclamation site. At present there are no feasible economic uses for the reclamation area portion of the Manila Bay.

- When completed, the Proposed Pasay Reclamation Project will be linked up with, and will serve as an extension of the existing activities/establishments, e,g, the Mall of Asia Complex located just across the Libertad Channel.

On a national context, the project will demonstrate that by itself and together with other existing and proposed reclamation projects in Manila Bay a sound harmony between environment and progress can be achieved as has been in other neighboring countries, principally Singapore, which propelled its growth through this type of undertaking.

Moreover, the following discussions are projections/estimations on the economic and social benefits including associated economic developments.

Economic Benefits

Provides impetus via availability of land that can built commercial, business and related developments in the futures such as:

- Mall areas
- Restaurants
- Offices
- Residential
- Leisure
- Tourist themed facilities

- Commercial
- Business
- Convention centers
- Entertainment centers

On a regional context, the growth of population in the National Capital Region (NCR) invariably requires corresponding increase in land on which to establish the people's needs such as expanded commercial, business, leisure and residential services. Such land requirements are provided by the project and are not readily available in contiguous and convenient location on which to establish these mixed-use developmental facilities.

Further, the National Capital Region (NCR) is not isolated from the other regions in terms of economic activities. Thus the economic growth of Pasay City has increased benefits to the other regions in terms of:

- Increased need for food supply which could be served by the agriculture-rich provinces in Central Luzon, e.g. Bulacan, Isabela, etc. or by the fish producing provinces e.g., Palawan; and

- Increased trade among regions such as in clothing and household products

On a national context, the project provides a model for development which can be paralleled in other regions/cities/provinces in the Philippines.

Tourism, one of the key economic activities of the country is boosted by the project for the following reasons among others:

- The site is near the airport providing easy access for overseas tourists
- Better security is provided
- The setting in Manila Bay lends value to aesthetics, one of the attractions for tourism.

1.3 Project Alternatives. **The alternatives (type and location) considered and nominated during the course of selecting the best option for which the EIS is prepared; The bases upon which the alternatives were rejected in favor of the preferred option; The significant differences in environmental impacts among the alternatives considered.**

The project/site is integral to the planning of the Philippine Reclamation Authority, which decided within its mandate the site and size of the Project. The PRA has master plan for the Manila Bay that is consistent with the Boulevard 2000 Plan**. (See Figure 1.12)**

On the other hand, the coastline of the City of Pasay is small/limited making the site the only feasible location for a reclamation project. Moreover the proposed project is consistent with the CLUP of the City and the City itself approved the project through Resolution 4373 and Resolution 4234. **(Figure 1.13) (Annex 3a and 3b).**

1.3.1 Options considered

The City of Pasay had therefore no other options considered in respect of site selection and due to the following reasons:

- The site is consistent with the Boulevard 2000 Plan.
- It is within the coastline of the City making access thereto highly desirable.

- Through agreements with PRA and the prospective agreement with the project developer, Pasay will enjoy a rare opportunity for acquiring land for development without cost to the City.
- Locating the project on-shore is not viable for the following reasons:

    - Lack of funds of the City to acquire on shore lands
    - Difficulty of consolidating project of this size in one contiguous site
    - Attendant serious problems including traffic congestion.
    - Outside of the City of Pasay the City Government has no authority to establish projects.

Contextualize site selection in terms of vulnerability/susceptibility to Liquefaction, Ground Shaking, Ground Rupture, Earthquake induced Landslides Volcanic eruptions, rain-induced landslide storm surge, tsunami, and flooding as well as extreme climatologic conditions (data can be obtained from NDRRMC and NAMRIA as well as other mandated agencies)

Although the Metro Manila Region in general and the reclamation site in particular are prone to natural risks/hazards, there exist engineering interventions to address such hazards.

Further, it is significant to note that the proposed reclamation project is in fact an extension of the various reclamation projects such as the Mall of Asia (MOA) complex. Establishments / areas adjacent to the project site have incorporated engineering design factors and have not to date experienced episodes of natural disasters.

On the other hand, other factors/parameters such as site selection in terms of vulnerability/susceptibility to Liquefaction, Ground Shaking, Ground Rupture, and Earthquake induced Landslides Volcanic eruptions, rain-induced landslide storm surge, tsunami, and flooding as well as extreme climatologic conditions are discussed in **Section 4** (Environmental Risk Assessment).

Siting: Alternative project locations including factors significant to the selection such as perception of affected communities with regards to project, ancestral domain issues, land classification, etc. Discuss other options on the siting of major components of the project within the project area.

- As discussed in the foregoing, the Pasay City government has no other viable alternative and thus plans to enter into an agreement with the Philippine Reclamation Authority (PRA) --the authorized agency which determined the technical, financial and environmental viability of the reclamation site. It is to be noted that even when the ECC shall have been granted, the project cannot be implemented without securing the Notice to Proceed (NTP) from the PRA. Such NTP shall be subject to further requirements of the PRA. Among which are the conditions of the ECC and other conditions related to the environmental aspects of the project.

- There are no issues in respect of land classification since the site is consistent with the CLUP of the city. Further, the city itself approved the proposed project.

- There are no Indigenous People in the site/region and hence the matter of ancestral domain is not germane to the Project.

- The matter of siting of the major components within the project is discussed in **Section 1.4** on Project Components.

- As to the different alternative choices of equipment that will be used, Pasay City government or the duly contracted project developer still has to offer this for bidding. However, it is definite that the best and credible and internationally-known contractors will qualify to the work. More comprehensive discussion is provided in **Section 1.4.**

1.3.2 Technology Selection Operation/Processes: *Project's advantage over alternative technologies, operation processes and engineering design*

The final selection of technology and processes to be engaged will be made after the engineering and design works have been completed.

The project involves land reclamation of approximately 360 hectares earmarked for various types of developments. The said reclamation of the project will be accomplished through a combination of hydraulic dredging from borrow pit areas offshore of the project site as filling with burrow materials. Approximately 112 million cubic meters of dredge fill and burrow materials are required to reclaim the areas up to the finished grade at an average elevation of 3.5 meters above MLLW and further discuss below.

Soil Stabilization

In any reclamation project, of paramount importance is the creation of good quality land that will serve the purposes for its envisioned development. To achieve such objective, a good source of filling materials or burrow pit areas should be utilized.

Soil Stabilization Alternatives

Considering availability of technology and equipment, several methods of soil stabilization have been studied for the project. These methods are described as follows:

1. Embankment or Surcharge Methods

   A volume of soil is placed over the reclaimed land to be improved. The weight of the surcharge will force out the escape of the entrapped water within the voids of the saturated underground soft soil thereby inducing settlement at an accelerated rate.

2. Sand Drain Piles Plus Surcharge

   This method involves the construction of vertical sand piles at certain spacing down to the bottom of the soft soil layer in question to allow the drainage of pore waters when the weight of the surcharge is imposed over the subject area. With the accelerated escape of the water from the voids within the soils, settlement is induced at a very much faster rate that if surcharge is used only without providing vertical drainage pathways. The subject area can therefore be made usable at a very much earlier date

3. Sand Composer Piles Plus Surcharge

   This method functions very much similar to the sand drains except that the composer piles can also serve later as vertical columns that will allow the stabilized land to support bigger loads. In the construction process, the sand composer piles are compacted vertically and laterally. Because of the later compaction that will be induced on the adjacent soft soils, pore water pressures will be increased accordingly. When the surcharge is finally placed over the subject area, the pore waters will be forced out to escape through the voids of the

sand composer piles thus accelerating the settlement very much faster than the natural consolidation process.

4. Well Point Plus Sand Drain Piles

   This is the use of well point equipment to dewater the soil down to the desired depths. The series of riser pipes are installed down to the reach of the pipes around the perimeter of the area to be stabilized. These risers are then connected to the horizontal head piles attached to a powerful pump that will drain out all the water within the soil. Continuous pumping is required to maintain the drawdown of the underground water level. For very impervious soils, the provision of sand drain piles is also necessary to shorten the time of area is no longer necessary since the dried soil serves as the surcharge for the underlying soft soil layers.

5. Dynamic Compaction

   This method involves the use of huge weights to be dropped by a crane over the area to be improved. The impact transmitted to the underlying soft soils builds up the pore water pressures within them and thus forces out the escape of the pore water to the surface.

6. Vertical Drains Plus Surcharge

   This method functions exactly the same as the Sand Drains Plus Surcharge Method. The only difference is that with this system, the sand drain piles are replaced with the vertical drains which are manufactured for the purpose in the form of wicks or strips and made of non-degradable materials. The core consists of ducts where water can flow upwards and wrapped around with very porous sheeting through which water can enter the core. The wick comes in various trademarks and designs but more or less uniform in the overall dimensions. For ease in handling and installation, the wick comes in coils.

All the above-described methods are to be first evaluated on the basis of technical considerations such as applicability to the project area with the type of soils as to be determined during the final geotechnical investigation, available equipment required, particularly the type and capacity and the characteristics of the newly reclaimed land as to load carrying capacity prior to stabilization. Cost evaluation will necessarily be considered also.

Preliminary evaluation is as follows:

1. Embankment or Surcharge Method – Preliminary calculations with about 5-meter high embankment indicated approximately 5 years to attain full consolidation. This is too long a period of time to wait for the utilization and disposal of buildable areas not taking into account yet the length of construction time required for the development of the site in terms of provision of roads, utilities, etc.

2. Sand Drain Piles Plus Surcharge – Under this method, the sand drain piles may not be continuous if improperly installed in addition to the fact that they are very much susceptible to shear failure during the planning of the surcharges. Further, the equipment required is usually heavy and require good construction surface which is not available yet on a newly reclaimed land. This was demonstrated by the experience of PNCC during the ground improvement of the Financial Center Area in MCCRRP.

3. Sand Composer Piles Plus Surcharge – The system is vulnerable to the same problems as the sand drain piles. In addition, during the process of compacting the piles vertically and laterally, they can easily be clogged with fine within the soil. Should this happen, resistance to flow of pore waters can become high thus requiring higher surcharge or embankment.

4. Well Point System Plus Sand Drain Piles – In addition to having the same problems as the sand drain piles, the presence of soil-laden water with high salinity is a potential source of problem for maintenance of the equipment.

5. Dynamic Compaction – The equipment required are huge and heavy that the newly reclaimed unconsolidated ground may not be able to support. Provision of matting and grillages is costly and very inconvenient every time equipment position transfer is executed. The methods are not very effective as proven by the test conducted by the PNCC for stabilization of the First Neighborhood Unit.

6. Vertical Drains Plus Surcharge – Under this method, the vertical drains have high breaking strength and reinforce the soil in tension. Various types of drains are commercially available that a specific type of drain can be chosen to be exactly consistent with the actual permeability of the soil. Equipment required to install the drain is very light and can easily be supported by the newly reclaimed land. The rate of flow within the drain is higher, thus less height of surcharge is required. From the economic viewpoint, the surcharge can be eliminated if good dredge fill materials are available. Upon completion of the reclamation, the dredge fill itself will function as the surcharge.

On the basis of the above discussion, it appears on a preliminary basis that Vertical Drains Plus Surcharge method is most feasible for the project.

Soil Stabilization Utilizing Vertical Drains Plus Surcharge

In general the reclaimed fill from the first alternative source of burrow directly west of the proposed reclamation is expected to be of the same quality as the existing upon 4 to 5 meters soft layer. Basically the major roads wherein the main utilities for drainage, water, electricity and telephone, will be stabilized mainly to protect these utilities from the damaging effects of large differential settlements commonly expected in this kind of development.

Soil stabilization basically consists of wick drains driven from the finished elevation of the reclamation which is about +3.00m, ranging from 11m to 15m at spacing of about 2.0 meters on center. This will be done for all the roads. At the top layer a sand mattress with a minimum thickness of 0.50m will be provided to serve as a way for the drained water underneath to be ejected. On top of this sand layer is the soil surcharge of about 3 meters thick required to consolidate the soft clay layer underneath. The soil stabilization plan as described has been designed to achieve a 90% consolidation in one year. About 70% consolidation will be achieved in 6 months. Based on the implementation schedule requiring about 5 year's development, it seems that the object of 90% consolidation in one year would fit in perfectly in the schedule. Secondly, the remaining 10% settlement which will occur for many years after all utilities are installed will practically have minimal damaging effects.

The soil stabilization Contractor who will undertake the installation of the wick drains as well as surcharging is also expected to provide for continuous monitoring.

Instruments such as inclinometers, piezometers, strain gages, settlement plates and surcharge slope indicators have to be installed by them. An extensive soil investigation will also have to be undertaken by them. This will be a combination of some actual soil boring and the rest dutch cone penetrometer test. Laboratory tests to determine vertical and horizontal consolidation properties of the soil as well as permeability will also have to be undertaken by them for final evaluation by the consultants.

Breakwaters and Bulkheads

The project involves, as one of its major components, the construction of main and secondary bulkheads of varying depths to retain the fill. These marine protection structures are planned to favorably enhance the existing physical environment at the project site, thus, the selection of their structural type becomes a major consideration. Therefore, in the design of these structures, the following factors were taken into account:

1. Foundation conditions which have significant influence on their settlement and stability and therefore on the type of structure.
2. Exposure to waves and related oceanographic conditions which control their geometry.
3. Availability of construction material to be used including costs which are significant determinants on the economic feasibility of the type of the structures chose.

Considering the above factors, two (2) general classifications of bulkheads are required for the reclamation area as dictated by the extent of their exposure to oceanographic conditions. These are the main bulkheads which are directly exposed to wave actions and the secondary bulkheads with less exposure to wave attacks. Foundation conditions have the same bearing on both, and therefore not considered in classifying the structures. The factors associated with soil will, however, be very important considerations in the selection of structure type to adopt for both classes of the bulkheads.

Main Bulkheads

As to type the structure, two (2) alternatives were considered for the bulkheads, namely: the rock mound type and the walled steel pipe piles.

Other structural types of bulkheads in addition to the two (2) chosen alternatives above were also considered such as the cellular and double steel sheet pile wall construction with tie rods and walling to reduce flexural stresses and increase stability. These were ruled out at the initial stage of the technical evaluation due to:

1. The type of the structure will be very susceptible to damage due to differential settlement considering that the first 4 to 5 meters of the seabed consists of very poor materials with very low shear resistance.
2. The tie rods and dead men will require substantial open space that may pose problems during the development of the area due to obstructions.
3. Probability of damage during the construction stage is high especially during the southwest monsoon when the structures are not yet filled up with dredge fills.

On the other hand, both of the alternatives considered are very reliable under very severe sea conditions as proven by experience on similar projects abroad, notably in Japan. Unlike sheets piles, walled steel pipe piles can be designed as free cantilevers and therefore can be driven down to firm foundation thus eliminating settlement problems. For the rock mound type, settlement is not foreseen to be critical since the structure can undergo considerable settlement without sustaining damage. In terms of construction, walled pipe pile bulkhead is very much superior to the rock mound type which normally takes considerable time to build. Technically, both alternatives can therefore, be adapted to the project. However, the final choice was made in favor of the rock mound bulkhead after evaluation of their costs. The superiority of the later in terms of shorter construction time can be nullified by the fact that will appropriate procedure and technologies, reclamation can be done even without the area already enclosed by the bulkheads.

Secondary Bulkheads

For the design of the secondary bulkheads, it appears that the upper portion just above the high waterline be made sloping for aesthetic reasons. This requirement is very advantageous from an engineering standpoint. With the finished grade at Elev. +3.50 meters and the high water at Elev. 1.00 meter, a minimum reduction in the height of 2.00 meters was made possible resulting to substantial reduction in lateral pressure due to the dredge fill. The use of cantilever sheet piling now becomes attractive considering less stringent requirements for embedment. However, upon evaluation of their costs, this alternative appear too costly and therefore, another alternative was considered – the rock revetment type.

The design details of the rock revetment type of bulkhead are based on standard dimension which will be firmed up in the detailed engineering design stage. The minimum weight of rocks specified was based on the dislodging forces of waves within a maximum height of 0.70 meter that is expected to be generated by the NE monsoon winds over the area. In the case of the main bulkheads, the required weight of the individual stones was determined as recommended by Dribarren for shallow water waves.

As in the case of the main bulkhead, stability was also the prime consideration in the design of the secondary bulkhead. A rock revetment type turned out to be the best alternative. Similarly, in order to solve the stability of the rock revetment, it also was apparent to remove the very soft upper soil layer averaging about 6 meters and replacing it with a much better selected dredge fill preferably sandy material with higher shear resistance. The solution will result with the soft soil completely removed and the new selected dredge fill seating on a hard soil layer, thus assuring stability of the revetment.

A summary table citing the various options for technologies is shown in **Table 1.3.**

Table 1.3 Summary of Various Technology Options for Soil Stabilization

Technology Aspect	Decision Parameters	Evaluation/Remarks
Embankment or Surcharge	Very long timetable	Not feasible
Sand Drain Piles Plus Surcharge	Engineering problems	Not attractive
Sand Composer Piles Plus Surcharge	Engineering problems	Not attractive
Well Point System Plus Sand Drain Piles	Maintenance problem	Not attractive
Dynamic Compaction	Very heavy equipment required	May not be suitable when land not yet consolidated

Technology Aspect	Decision Parameters	Evaluation/Remarks
Vertical Drains Plus Surcharge	Various types commercially available	Most likely option

***It is important to note that the discussions made above are based on preliminary studies and experiences with similar projects in the Manila Bay. The Final Design and Engineering Details will be undertaken post-ECC ***

Discussion of alternative measures for the prevention of the occurrence of major impacts (eg. air and water pollution, possible groundwater and land contamination, industrial accidents/risks such as fire and explosion, oil spillage, noise, odor etc.)

- ## Prevention of air, water and land pollution / contamination

Air pollution- Although considered minimal because the activities are at sea and the operation of air pollution discharging equipment (pumps using diesel oil) is intermittent and short lived mitigating measures is still provided. These are:

- Use of efficient fuel (e.g. biodiesel)
- Use of efficient engines
- On board smokestacks

Noise and Odor- By virtue of the reclamation activities being at sea and away from population centers, noise problems are deemed not highly significant. Further, noise levels will be kept at low levels (less than 200 dBA) and noise generating activities will be largely confined during day time.

There are no substances or activities/process that will generate odor nuisance.

Water pollution- Also deemed minimal since this would be generated by the domestic activities of the construction/dredging personnel who are basically based on board sea vessels

Preventive measures will consist of provision for on board toilet and waste water collection system the aqueous wastes to be discharged and disposed on shore through third party accredited contractors.

Possible ground water and land contamination

There will be no discharges of wastes to onshore lands except in a case whereby the dredged unwanted sea bed materials will be disposed onshore. In this case, separate permits and or clearances will be secured from the concerned authorities. At this stage of the project cycle, the site of disposal is still to be firmed up.

There will be no discharges of wastewater to onshore that will result in ground water contamination.

Accidents/risks and Oil spillage

As discussed in Section IV, Environmental Risk Assessment the potential accidents/risks are:

- Collision of dredging vessel with other sea craft or with the existing fish pens along the navigational lane.
- Potential oil spills.
- Fire on board vessel.

Resources: Discussion of the alternatives considered in the course of selecting the resources to be tapped and how the decisions were made in favor of the preferred resource. Include discussions on power and water sources. Discussions should also be in the context of climate change, if applicable.

The alternative option involving the resources to be tapped is principally focused on the source of the fill materials and rocks. The decision on the best options will be made at a later date when the engineering works shall have been completed, but initially the factors for making the best options are:

- **San Nicholas Shoal**

  - Conditions of the ECC being applied for by PRA for the SNS dredging project.
  - Cost consideration.
  - Agreements and restrictions/guidelines from PRA.
  - Quality in respect of the requirements of the project based on engineering works including final geotechnical investigation.

- **Lahar from Mt. Pinatubo**

  - Suitability with respect to quality.
  - Transport considerations.
  - Cost considerations.
  - Permitting/Clearances consideration.

- **Others**

  To be evaluated

- **Rocks**

  - The various options are to be evaluated and the appropriate selection will depend partly on
    (a) The filling requirements based on the final engineering works
    (b) Cost
    (c) Transport consideration and
    (d) Permitting/clearances requirements.

1.4 Project Components

1.4.1.1 Identification of Major Components including technical details such as specifications, size (e.g. length, width), capacity, number, etc. Specify the operations and process (from sourcing to construction operation). Including drainage as project component

Tabulation of components together with specifications and areas.

Specifications should be based on the projection of estimated number of locators and number of population capacity.

The major components are reckoned from the scope of Phase 1 of the project which is confined to the activities through the attainment of reclaimed land of separate 300 hectares and 60 hectares in area. Only horizontal developments/works are involved in this phase. The components are shown in **Figure 1.14** “Layout of the Project Facilities, Components and Buffer Zones”.

The components are tabulated in **Table 1.4.**

Table 1.4 Summary of the Major Project Components

Components	Specifications	Details (Subject to final engineering)
Components of Land Use (Total Land Area = 360 has)		
Roads and Open Spaces	30 % or total area or 108 has.	To be based on final master plan. Master Plan needs to incorporate LGU's option of utilizing the entire 60 has for majority of its partial share, balance at the 300 has land Initial estimate of 15,120,000 square meters of building gross floor area
Developable Land @ 70 % = 252 hectares		
Share of LGU (PRA & Pasay)	30 % or 75.6 has	
Share of Developer	70 % or 176.4 has	
Islands		
• Southern Island	60 has	Estimated total perimeter length of 2,498 meters and a width of 1,156 meters at its widest point;
• Northern Island	300 has	
Total	**369 has.**	
Platform elevation	4.0 m above MLLW	Per PRA requirement
Water Channels	**200 meters Distance**	To serve as buffer zone and for water circulation.
Access Bridge	300 has reclamation 200 – 1000 meters 60 has reclamation 200-400 meters	To be firmed up during the final engineering works
Vertical Containment Structure	Containment wall (seawall) with estimated length of 9,614.75 linear meters around the entire reclaimed area consisting of a combination of rock mound	Will be firmed up during the Detailed Engineering Works
Wave Deflector	Concrete w water sump	1.5 meters above the platform level
Fill Materials	100 Million cu m fills 12 Million cu m rocks	Subject to final engineering
SUPPORT FACILITIES (Note 1)		
Drainage System	To consider using the Rational Formula Q = 0.278 CIA "	To be yet designed post ECC. In the Rational Formula **Q** = Design discharge in m^3/sec **C** = runoff coefficient which is dependent on topography, soil type and degree of development of the area **I** = rainfall intensity in m^3/hr **A**= drainage area in km^2
Electricity, water and communications systems	Temporary connection with Meralco e.g. for lighting purposes;	

Components	Specifications	Details (Subject to final engineering)
	generating sets for construction works. Mobile communications	
Waste water treatment units	In house facilities during the Reclamation Phase (e.g. toilets in barges) Disposal through accredited waste handling entities	Use of approved portable toilets on reclaimed land.
Water supply system During Reclamation Phase	Internal sourcing by individual contractors	Mobile water tanks most likely to be used by contractors; no underground water extraction.
Street Lighting	High Pressure Sodium Lamps	To be designed
COMPONENTS NOT PART OF ECC APPLICATION		
Mixed Development Plans e.g. Vertical Structures, Commercial Establishments, Offices, Theme Park, etc. To be firmed up during the final Master Planning Study and Design		

1.4.1.2 Identification of other Support Facilities

Identification of materials/product handling facilities, infrastructure requirements (transport—road/rail/ship, power, water supply and storage, storm water drainage, Sewerage, Telecommunications, accommodation and other infrastructure)

- **Materials Handling**

The materials handling facilities of relevance to this type of project is the trailer dredger which will haul the fill materials from the envisioned source which is the San Nicholas Shoal. This type of dredger is described in **Section 1.4.2.**

The potential sources of the requirements for rocks have yet to be determined but initially these may be shall be sourced from Rizal and Bataan Provinces. Barges will be used for the transport at sea of these materials.

- **Accommodation**

Accommodation for on vessel/barge personnel will be at the sea crafts. There may not be a need for provisions for accommodation on the reclaimed land during soil stabilization but this will be decided on by the contractor.

- **Power and Water**

During the dredging/reclamation works, electrical power will be required by sea craft and equipment (e.g. pumps) on board and will be on board these sea crafts. Water supply by the vessel/barge crews will also be on board.

During the period of soil consolidation which may take approximately one (1) year the minimal power requirements of the maintenance crew on the reclaimed land will be sourced through connection with Meralco while water can be tapped from the MWSS-designated concessionaire.

Storm water drainage shall be constructed as part of the horizontal development and will likely be underground concrete culverts. The preliminary plan for the discharge outfalls is seen in **Figure 1.14.**

- **Telecommunications**

Telecommunications will largely be through the mobile cell phone system.

1.4.1.3 Identification of pollution control devices including other waste management and corresponding facility being served or connected

Waste Management Systems such as wastewater, treatment facility (WTF) / Sewage Treatment Plant (STP), air pollution control devices, Materials Recovery Facility (MRF) etc. Safety/emergency/ decontamination procedures and management, if applicable

Pollution Control Devices

- **Wastewater**

This will essentially be generated by personnel on board the sea crafts (dredging vessels and rock haulage barges) which are self-contained having their individual toilet and waste collection facilities. Wastewater will be discharged through third-party waste treaters.

On-site portable toilets and wash rooms may be planned for the soil stabilization phase of the reclamation works.

- **Air Pollution Control Device (APCD)**

The sea crafts will have their individual smoke stacks to serve as equivalent APCD which will be connected to the exhaust of the pump engines.

- **Other Wastes**

The perceived relevant wastes for the proposed project are silts. Silts are the solid wastes from the dredging of undesired sea bed materials. Silt curtains will be used as waste management facility to contain the dispersal of these materials.

Other type of wastes is deemed not applicable for this type of project since no appreciable amount of garbage or solid wastes will be generated from the activities involved

1.4.1.4 Identification of safety devices/ emergency facilities to be used in the occurrence of industrial accidents/emergencies (ie. fire, explosion, accidental chemical/oil spillage etc.

The appropriate safety devices/facilities to be used should necessarily relate to the nature and probability of occurrences of emergencies, hence such probabilities is discussed hereunder.

Generally, there are no societal risks involved since the reclamation/dredging and associated works are to be undertaken in non-populated area, i.e. at the sea.

No chemicals, flammable materials or oil (except as fuel for equipment) are used in the project.

Water craft/sea going vessels will be used to carry filling materials from source to project site. Sailing of these vessels would as in any other case bring about the natural risk of collision. However the sailing of these vessels will take a short distance only between site and San Nicholas Shoal in Cavite.

The key facilities/safety devices are as follows:

a. Firefighting equipment on board the dredging vessel

Firefighting equipment complying with international standards, e.g. CO2 or chemical fire extinguishers will be installed on board.

b. First aid kit for treatment of injuries due to accidents

First aid medicines and accessories will be made available for use in case of injuries to the construction crews.

c. Communication system

Effective communication system, e.g. radio and mobile telephone are vital safety-related devices to keep the barge crew and construction workers at sea updated on any emergencies such as typhoons and tsunamis.

d. Personnel Protection Equipment e.g. safety helmets, boots, eye goggles, ear mufflers and others,

e. Collision with Fish Pens During Transport to the San Nicholas Shoal

The dredging vessel can readily avoid this by using the safe navigational lane and avoiding transport during inclement weather conditions.

Provided below is the summary matrix of potential risks and emergency situations of the proposed project.

Table 1.5 Summary Matrix of Potential Risks and Emergency Situations

Activities	Potential Risks	Vulnerable Parties/ Affected Resources	Safety Devices/Facilities
Sailing of Dredging Vessel	Collision with Other Vessels	Barge crew and dredging operators	Communication Facilities First Aid Equipment Navigational Equipment Personnel Protection Equipment
	Collision with and damage to fish pens during navigation	Fish pens	Communication Facilities First Aid Equipment Navigational Equipment
	Accidental Oil	Marine Ecology	Oil Spill Boom

Activities	Potential Risks	Vulnerable Parties/ Affected Resources	Safety Devices/Facilities
	Spills from Fuel of Vessel		
Operation of various equipment	Accidents	Construction crew	Communication Facilities First Aid Equipment
Other types of activities	Natural disasters, earthquakes, tsunamis, etc.	Construction crew	Communication Facilities Personnel Protected Equipment

1.4.1.5 General layout of facilities; **Footprint of proposed layout of project facilities. Maps showing the precise location of the project area, and in particular, the location and boundaries of project area, location and footprint of project components, and location of all proposed buffers**.

The map for the reclaimed land is given in **Figure 1.14** showing therein the general layout of the components and facilities. In this map, the buffers are shown, i.e. the space/open channels between the 300 hectare and the 60 hectare reclamation and between the 60 hectare and the Libertad Channel. Further, the expected navigational lane for the transport of the dredging vessel to and from the San Nicholas Shoal in Cavite is also shown.



Figure 1.14 Layout of the Project Facilities, Components and Buffer Zones

1.4.1.6 Contextualize using the PAG-ASA 2020 and 2050 projected rainfall/temperature data

The PAG-ASA temperature predictions are shown in **Table 1.6.**

Table 1.6 PAG-ASA Climate Change Predictions for Temperatures

	OBSERVED BASELINE (1971-2000)				CHANGE IN 2020 (2006-2035)				CHANGE IN 2050 (2036-2065)			
	DJF	MAM	JJA	SON	DJF	MAM	IIA	SON	DJF	MAM	JJA	SON
NCR												
METRO MANILA	26.1	28.8	28.0	27.4	1.0	1.1	0.9	1.0	2.0	2.1	1.8	1.91

The maximum temperature change may be expected in the 2050 period while the reclamation project (construction phase only) will be completed before 2020. Hence the temperature projections are not deemed relevant for this project.

On the other hand, during the operations phase, temperature will be a factor in the air conditioning systems of the various buildings, establishments and locators. This is

because the design of air conditioning system is based in part on ambient temperatures as shown below.

Design Basis for Air Conditioning Systems

- Dry Bulb Temperature
- Mean Coincident Wet Bulb Temperature
- Daily Range
- Degree Days
- Ground Temperatures
- Wet Bulb Temperature & Mean Coincident Dry Bulb

The PAG-ASA rainfall predictions are shown in **Table 1.7.**

Table 1.7 PAG-ASA Climate Change Predictions for Rainfalls

	OBSERVED BASELINE (1971-2000)				CHANGE IN 2020 (2006-2035)				CHANGE IN 2050 (2036-2065)			
	DJF	MAM	JJA	SON	DJF	MAM	IIA	SON	DJF	MAM	JJA	SON
NCR												
METRO MANILA	26.1	28.8	28.0	27.4	1.0	1.1	0.9	1.0	2.0	2.1	1.8	1.91

These predictions (for rainfalls) can be factored in the design of the drainage system. Moreover, the other climate-change factor is sea level rise, which is considered in the finished platform elevation wherein a safe value of 3.5 meters above MLLW is used.

1.4.2 Process Technology

TYPICAL HYDRAULIC DREDGE



According to National Oceanic and Atmospheric Administration (NOAA), "dredging" is described as the removal of sediments and debris from the bottom of lakes, rivers, harbors, and other water bodies.

The proposed project involves land reclamation of approximately 360 hectares. The reclamation of the project will be accomplished through a combination of **hydraulic dredging** from borrow pit areas offshore of the project site is filling with burrow materials.

The said dredging can be undertaken either hydraulically or mechanically but as mentioned the proposed project will use hydraulically type of dredging. Hydraulic dredging is a floating dredge or pump by which water and soil, sediment, or seabed are pumped, either on board for sifting, as for clams or oysters before they are discharged overboard, or through a series of floating pipes for discharge on shore.

Hydraulic digging makes use of the erosive working of a water flow. For instance, a water flow generated by a dredge pump is lead via suction mouth over a sand bed. The flow will erode the sand bed and forms a sand-water mixture before it enters the suction pipe. Hydraulic digging is mostly done in cohesion less soils such as silt, sand and gravel.

The transport of the dredged soil can be done by hydraulically or mechanically too, ether continuously or discontinuously. Continuous transport can be undertaken through a pipeline or conveyor belts while discontinuous transport can be done via grab, ship or vehicles.

Deposition of soil can be done in simple ways by opening the grab, turning the bucket or opening the bottom doors in a ship. Hydraulic deposition happens when the mixture is flowing over the reclamation area. The sand will settle while the water flows back to sea or river.

Dredging equipment can have these functions integrated or separated.

The choice of the dredger for executing a dredging operation depends not only on the above mentioned functions but also from other conditions such as the accessibility to the site, weather and wave conditions, anchoring conditions, required accuracy and other consideration such as economics.

Volume of Works

The proposed project will involve an approximately 112 million cubic meters of dredge fill and burrow materials are required to reclaim the areas up to the finished grade at an average elevation of 3.5 meters above MLLW. This total volume does not include the allowance for subsidence of the original ground once overlain with the hydraulically placed fill materials. Filling materials will most likely be obtained from the off-shore borrow area at San Nicholas Shoals.

Soil Stabilization (Also discussed in Section 1.3.2)

Soil stabilization is the key to a successful reclamation methodology.

It is a common knowledge in all reclamation projects that settlement or ground subsidence will occur not only due to the consolidation of the fill but also due to the settlement of the original underlying soil itself. It is also a fact that the rate and amount of settlement are highly dependent on the type of the original ground stratification. Further, depending upon the results of the detailed investigation of the available burrow pit areas, relatively poor soil may sometimes have to be utilized on some portion of the project site due to other considerations outside of the technical requirements thereby making some parts of the reclaimed land of low grade.

Several methods of soil stabilization have been studied for the project. These include the following:

Table 1.8 Comparison among Various Stabilization Methodology

Methodology	Key Feature(s)	Environmental Aspect(s)
Embankment or Surcharge	About 5 years to complete	No significant problems
Sand Drain Piles Plus Surcharge	Susceptible to Shear Failure	No significant problems
Sand Composer Piles + Surcharge	Same as in above; clogging with fine material within soil	NO significant problems
Well Point System Plus San Drain Piles	Presence of soil-laden water with high salinity	No significant problems
Dynamic Compaction	Huge and heavy equipment	Noise problem
Vertical Drains Plus Surcharge	High breaking strength of vertical drains, reinforced soil in tension, light equipment	Minimum noise problem Acceptable stabilization time

Given the above comparison and also in consideration of economics, the method of soil stabilization utilizing vertical drains plus surcharge will most likely be selected. The fill material will be sourced from the San Nicolas Shoal located directly west of

the proposed reclamation project. The fill material is expected to be essentially of the same quality as the material used in the existing reclamation projects within the project site. The major roads where the main utilities for drainage, water, electricity and telephone lines are reserve and will be stabilized more effectively to protect these utilities from the damaging effects of large differential settlements that could be expected in this type of developmental projects.

Soil stabilization basically consists of wick drains driven from the finished elevation of the reclamation which is +3.5 m. ranging from 11m to 15m at a spacing of about 2.0 meters on center. This will be done for all the roads. At the top layer a sand mattress with a minimum thickness of 0.50m will be provided to serve as a way for the drained water underneath to be ejected. On top of this sand layer is the soil surcharge of about 3 meters thick required to consolidate the soft clay layer underneath. The soil stabilization plan as described has been designed to achieve a 90% consolidation in one year. About 70% consolidation will be achieved in 6 months. This will be done for all the road right-of-way (RROW). At the top layer, a sand mattress will be provided to serve as a way for the drained water underneath to be ejected. On top of this sand layer is the soil surcharge required to consolidate the soft clay layer underneath.

Monitoring instruments shall be used to ensure the integrity of the work, such instruments to include inclinometers, piezometers, strain gauges, settlement plates and surcharge slope indicators. An extensive soil investigation will necessarily be undertaken, which will include a combination of actual soil boring and dutch cone penetrometer test. Laboratory tests will also be undertaken to determine the vertical and horizontal consolidation properties of the soil as well as permeability.

General Description/Methodology of the Reclamation Process

The above discussions focus on the soil stabilization stage while that below deal with the activities prior to soil stabilization.

The dredging process generally involves the following:

1) Removal of soft unsuitable materials at the sea bed by dredging.

2) Deposit of the dredged materials at a suitable area to be pre-approved.

3) Sourcing of a good sand form from the nearest source within Manila Bay by using dredgers and depositing the hydraulic sand fill at the reclamation site.

   The sand fill will be first subjected to chemical tests to ascertain suitability and absence of toxic elements.

4) Continuation of the depositing of the hydraulic sand fills to cover an area that will allow the installation of equipment for sheet still piling.

5) Driving of steel sheet piles at the boundaries of the reclamation property to enclose the reclamation.

6) Sourcing of the hydraulic fill from a nearby and suitable area and depositing the same at a designated area by pumping and spraying.

7) Dredging of the excess selected hydraulic fill material beyond the property line defined by the steel sheet piles and pumping and spraying inside the reclaimed property.

8) Level the reclamation area to the desired finished grades and slopes using earthmoving equipment

9) Installation of Breakwater.

10) Soil stabilization as previously described.

Among the key features of the dredging works are the following:

- **Vertical Containment Structure**

Vertical containment structure will be constructed to prevent soil erosion. The proposed vertical containment structure consists of a double steel sheet pile structure (front and anchor wall) tied together with a tie rod.

It is also foreseen to construct a wave reflector wall in order to avoid as much as possible overtopping of sea water during severe weather/sea conditions.

In anticipation that the underlying strata at the perimeter of the platform would consist of soft clay and to replace it with suitable fill material, a trench has to be dredged under the vertical containment structure up to the resistant substrata.

Main Plant and Equipment for the Dredging and Reclamation Works

A typical Trailer Suction Hopper Dredger (TSHD) is shown in **Figure 1.15.**

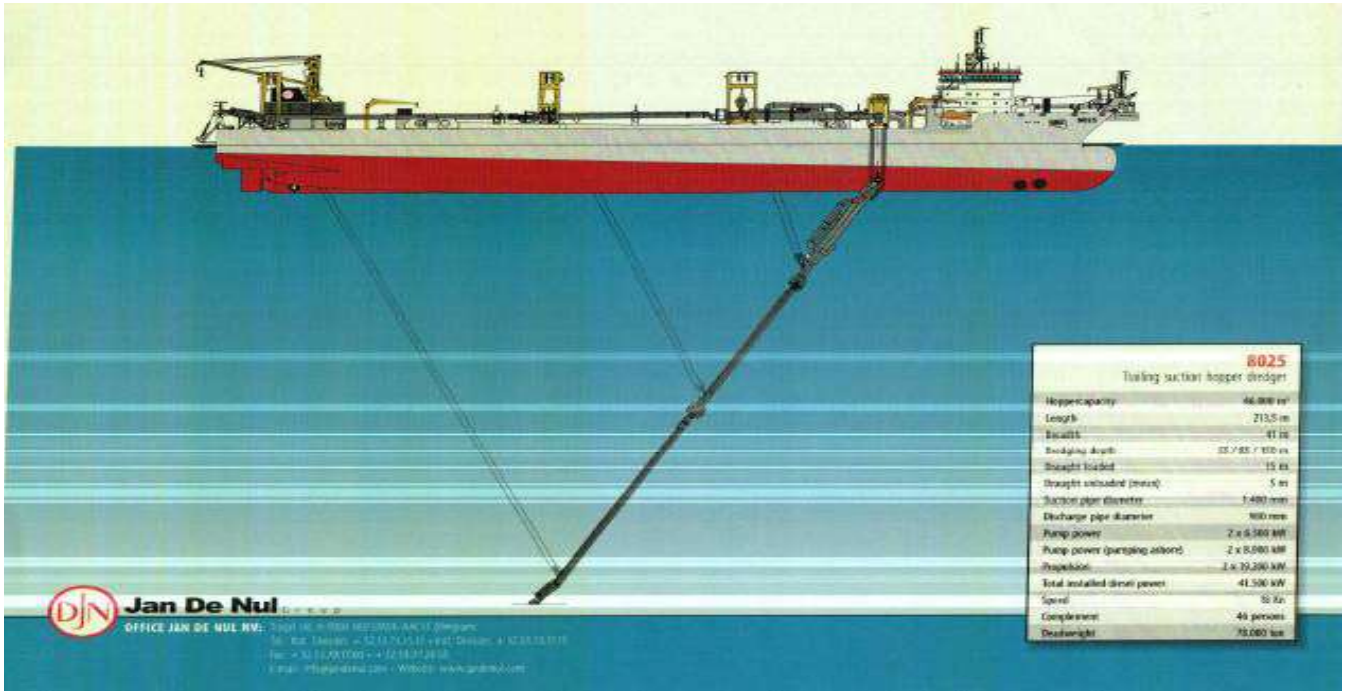


Figure 1.15 A Typical Trailer Suction Hopper Dredger

A general comparison of the various dredging technology/equipment is shown in **Table 1.9.**

Table 1.9 Comparison of Dredging Technology/Equipment

	Bucket Dredger	Grab Dredger	Backhoe Dredger	Suction Dredger	Cutter Dredger	Trailer Dredger	Hopper Dredger
Dredging sandy materials	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dredging clayey materials	Yes	Yes	Yes	No	Yes	Yes	No
Dredging rocky materials	Yes	No	Yes	No	Yes	No	No
Anchoring wires	yes	Yes	No	Yes	Yes	No	Yes
Maximum dredging depth [m]	30	>100	20	70	25	100	50
Accurate dredging possible	Yes	No	Yes	No	Yes	No	No
Working under offshore conditions possible	No	Yes	No	Yes	No	Yes	Yes
Transport via pipeline	No	No	No	Yes	Yes	no	No
Dredging in situ densities possible	yes	yes	Yes	no	Limited	no	no

On the basis of the above and to meet the requirements for a mobile dredging equipment that will also dredge and transport the fill/borrow materials to the reclamation site, the trailer dredger appears to be the most logical choice.

Performance/Design Specifications

The performance and design specifications for this particular reclamation project will be developed for the purpose of bidding of the various contractual works to be most likely undertaken by separate contractors. The major work categories are (a) dredging and filling (b) construction of containment structures and (c) stabilization work.

The specifications will necessary be developed after the securing of the ECC so that the conditions of the ECC can be appropriately integrated/included in the Terms of Reference for the various work components.

For reference purposes following tentative specifications are provided.

Table 1.10 Specifications of the Trailer Suction Hopper Dredger

Trailing suction hopper dredger	
Hopper capacity	46.000m^3
Length	213.5m
Breadth	41m
Dredging depth	55 / 85 / 150 m
Draught loaded	15 m
Draught unloaded (mea)	5m
Suction pipe diameter	1.400 mm

Discharge pipe diameter	900 mm
Pump power (pumping shore)	2 x 6.500 kW
Propulsion	2 x 19.200 kW
Total installed diesel power	41.500 kW
Speed	18 Kn
Complement	46 persons
Dread weight	78.000 ton

Table 1.11 General Specifications of the Reclamation Project

Components of Land Use (Total Land Area = 360 has)	
Roads and Open Spaces	30 % or total area or 108 has.
Developable Land @ 70 % = 252 hectares	
Share of LGU (PRA & Pasay)	30 % or 75.6 has
Share of Developer	70 % or 176.4 has
Islands	
• Southern Island	60 has
• Northern Island	300 has
Total	**360 has.**
Platform elevation	3.5 m above MLLW
Water Channels	**200 meters Distance**
Access Bridge	300 has reclamation 200 to 1000 meters 60 has reclamation 200 to 400 meters
Vertical Containment Structure	Containment wall (seawall) with estimated length of 9,614.75 linear meters around the entire reclaimed area consisting of a combination of rock mound
Wave Deflector	Concrete with water sump
Fill Materials	100 Million cu m fills 12 Million cu m rocks

Specifications for key sub-components

The wave deflector and breakwater will still have to be determined and designed. The conceptual specifications are illustrated below.

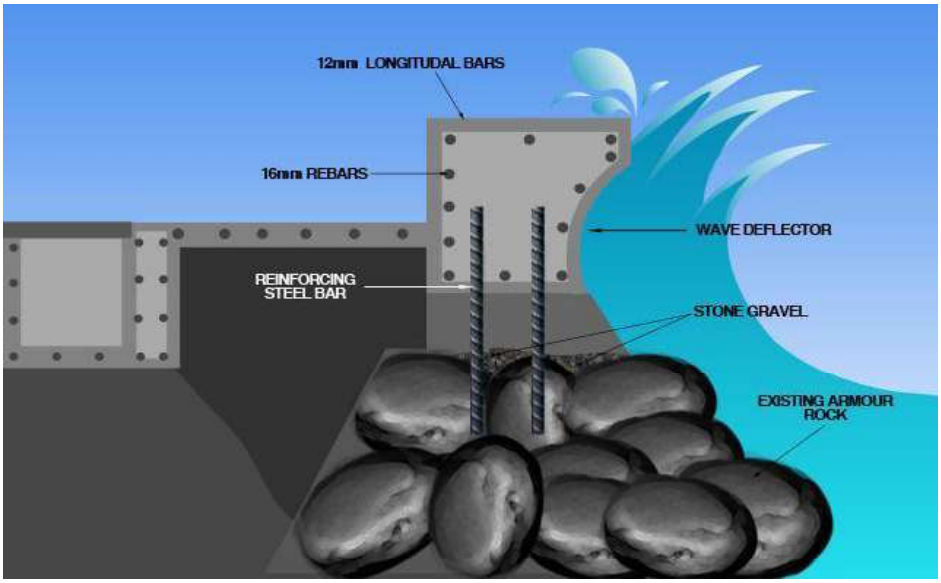


Figure 1.16 The Wave Deflector

The materials specification for the wave deflector will be of steel and stone/rock construction as shown above. The concave-shaped deflector will be made of steel with reinforcing bars for structural support.

General Specifications for the Fill Materials

- All materials used for fill shall be free of rock boulders, wood, scrap materials, organic matters and refuse.
- These should not have high organic content.
- Not more than 10 percent by weight shall pass the No. 200 sieve (75 microns). Maximum particle size shall not exceed to100 mm diameter.
- Maximum particle size shall not exceed 75 mm.
- Shall be capable of being compacted in the manner and to the density of not less than 95 %.
- Shall have a plasticity index of not more than 6 as determined by AASHTO T 90.
- Shall have a soaked CBR value of not less than 25 % as determined by AASHTO T 193.

General Specifications for Rocks

- Rocks should be angular, hard, durable and not likely to disintegrate in seawater,
- Minimum unit weight is 2,650 kg/cu.m. on dry basis
- Rocks of the primary cover layer should be sound durable and hard and should be fee from laminations, weak cleavages and undesirable weathering.
- Following test designations should be complied with
- Apparent Specific Gravity ASTM C-127
- Abrasion ASTM C-131

Description of construction activities (horizontal development)

The horizontal development activities are intended to prepare the reclaimed land for use of the prospective locators, principal use of which are the construction of buildings, stores, offices and similar vertical structures.

The major construction works involve:

- Construction of road network
- Installation of street lightings
- Construction of main drainage culverts
- Installation of electrical lines and connections
- Installation of water lines and connections
- Installation of communication lines

The soil stabilization may take a minimum of one (1) year and during this period the main activities involve are

- Maintenance of the reclaimed land
- Security of the premises

Inclusion of flow-sheets/diagram for the operations and the anticipated rates of inputs wastes and recycle streams

- Flow sheets/diagrams for the reclamation work. This is illustrated in **Figure 1.17.**

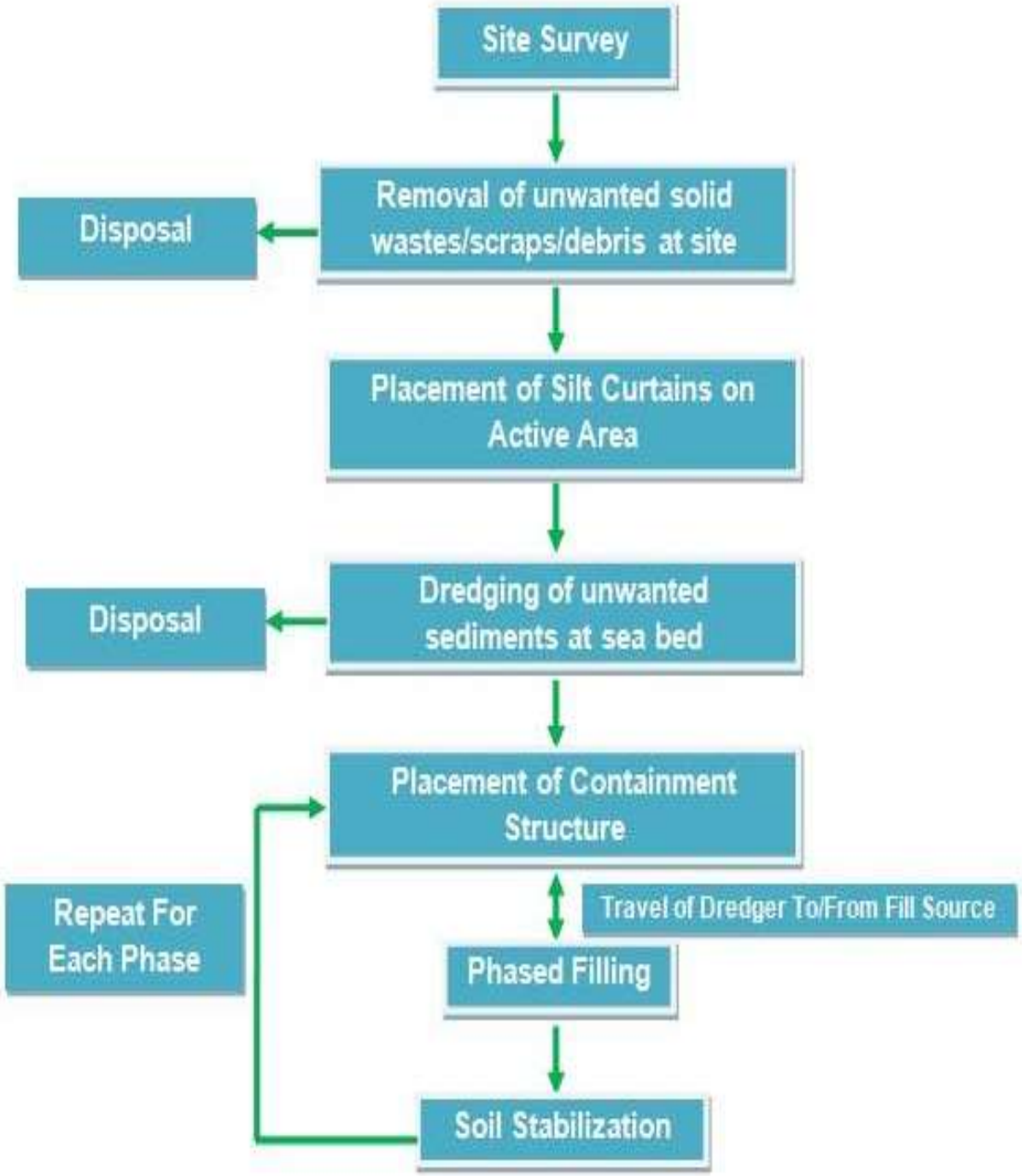


Figure 1.17 Simplified Flow sheet/diagram for the reclamation works

Rates of Inputs of inputs, wastes and recycle streams

For this project following are the pertinent initial information

- **During the Clearing of Seabed debris and scraps**

All the unwanted materials are considered wastes, the quantity shall be determined during a survey to be undertaken prior to the dredging activities.

- **During the Dredging of the Sea bed for unwanted sea bed silts and sediments**

All the unwanted silts/sediments are considered wastes, the quantity shall be determined during a survey to be undertaken prior to the reclamation activities.

- **During the reclamation/filling in activities**

The inputs are the fill in materials to be dredged from source, e.g. SNS and the rock materials. There will be no waste or recycle streams.

The input volume is

100 Million for Fill Materials
12 Million for Rocks

Power and Water Supply

Power- during the dredging/reclamation works, electrical power will be required by sea craft and equipment (e.g. pumps) on board and will be on board these sea crafts.

During the period of soil consolidation which may take approximately one (1) year the minimal power requirements of the maintenance crew on the reclaimed land will be sourced through connection with Meralco.

Water- Water supply by the vessel/barge crews will also be on board. Mobile water tanks most likely to be used by contractors. No underground water extraction. Internal sourcing by individual contractors or water can be tapped from the MWSS-designated concessionaire.

Waste Management Systems such as wastewater treatment facility (WTF) / Sewage Treatment Plant (STP), air pollution control devices. Materials Recovery Facility (MRF) etc. Safety/ emergency/ decontamination procedures and management, if applicable.

Discussed in **Section 1.4.1.3.**

1.5 Project Size

The project will consist of:

360 hectares of reclamation with approximate dimensions as follows:

- Estimated length of 2,498 meters
- Estimated width of 1,156 meters at its widest point

1.6. Development Phases in terms of specific activities (with special attention on those with significant environmental impacts as well as climate change adaptation options relevant to the project and project activities) and corresponding projected implementation timeframes:

- ***Pre-construction*** *(e.g. planning, acquisition of rights to use land, etc.)*

  There are no activities during this phase that will result in significant environmental impacts.

- ***Construction*** *(e.g. land/site clearing, temporary housing, transport of materials, health and other services for the workforce)*

  The various dredging and reclamation activities described in the previous sections are summarized in **Table 1.12** with focus on potential environmental impacts.

Table 1.12 Summary of Various Dredging and Reclamation Activities

Major Activities	Environmental Impact	Climate Change Adaptation
Dredging at Site for Removal of Unwanted Bed Materials	Potential for silt dispersal	Not applicable
Sailing of Dredger to Source of Fill Materials	Potential Oil Leaks	Not applicable
Filling of Reclamation Area	Potential for silt dispersal	Not applicable
Soil stabilization	Essentially Nil	Not applicable
Domestic activities of construction workers	Domestic waste and garbage generation	Not applicable
Corresponding projected implementation timeframes: From commencement of the works up to turn over of the reclaimed land to the LGU an estimated time of five (5) years is envisaged.		

- ***Operation*** *(projected period of start-up/commissioning/full operation of various project components) include discussion on the operation of various components (as identified above) in terms of raw materials and fuel requirements, infrastructure requirements (transport—road/rail/ship, power, water supply and storage, storm water drainage, sewerage, telecommunications, accommodation and other infrastructure), waste management (characteristics and quantities of waste materials: wastewater, air emissions, solid wastes - toxic and hazardous, non toxic and non hazardous)*

  The operations phase involves the construction of buildings and structures by various locators and the operation of their activities, e.g. food stores, convention centers, movie houses, etc. This phase is not included in the scope of this EIS and in the application for an ECC.

- ***Abandonment.*** *Final Rehabilitation/ Decommissioning Plan, to include Land/soil restoration, decontamination or remediation activities and procedures & projected schedule. Should discussions about strategies and methods for final rehabilitation of the environment disturbed by the project. The land use suitability of the various land disturbance types should also be described.*

The proposed decommissioning plan envisaged in terms of the following:

- **Procedures for the decommissioning of the project components;**

  The project components are largely the reclaimed land including the infrastructures therein constructed e.g. roads open spaces, drainage culverts, electrical and water lines, etc.
- **Transport/disposal of equipment and other materials used in the plant's operation;**

  The equipment and other materials used in the reclamation and dredging works would have been returned or claimed back by the contractors.

- **Remediation of contaminated soil and water resources due to spills and leakage of chemicals and other materials used in the operation;**

  There are no spills and leakages during the process of soil stabilization and hence this aspect is not relevant.

- **Alternatives for the future use of abandoned area;**

  The proponent and its Joint Venture Partners can bid out the project to private sectors for their use.

- **Consistency with long term zoning and land use development plan of the municipality;**

- **Rehabilitation/ restoration plans, if any**

  The project is consistent with the long term zoning and land use development, noting that the Proponent is the LGU itself.

1.7 Manpower. *Preferred scheme for sourcing local from host and neighboring LGUs*

○ CONSTRUCTION PHASE

The proposed project will employ an estimated **100 - 500 persons** will be used during the peak construction stage. Priorities are given to qualified residents of the city in filling up the manpower requirements of its consultants and contractors during the construction stage of the project and of its locators.

There are no known indigenous peoples in the city. The nature of the project construction and the need to work at the project site may not encourage women.

Expertise / skills needed for the dredging vessel

Qualified SCUBA divers will be required in underwater works such as but not limited to:

- Underwater survey for debris and clean up
- Installation of wick drains

- Inspection of underwater works such as of the containment structure, of piles if needed below surface water portions of the reclaimed land.

These personnel will be given prior training if required, and will be provided with the appropriate tools and equipment.

Expertise/skills needed for the dredging vessel

These personnel will be selected by the dredging/reclamation contractor in accordance with its policies and qualifications requirement. However, in general terms, following are major expertise/skills requirement.

Table 1.13 Manpower Requirements

POSITION	Expertise/skills needed for the dredging vessel
Vessel Master	A registered marine officer
Chief Mate	Most senior officer experienced in hopper and cutter operations
Officer-in-Charge of Navigational Watch	Experienced in sea voyages/nautical skipper
Chief Engineer	Experienced in mechanical, e.g. propelled cutter, rotating equipment e.g. pumps.
Second Engineer	Same general skills as the Chief Engineer but of lesser years of experience.
Third Engineer	In charge of maintenance and repair works. Must possess experience in repair of mechanical and electrical equipment
Others ○ **Piping personnel, greaser** ○ **First Aid Personnel** ○ **Cook** ○ **Sanitation personnel** (e.g. for garbage disposal, for cleaning of vessel facilities, etc)	
Engineers and Inspectors	During the soil stabilization phase, **engineers and inspectors** will monitor the progress of the soil stabilization.
Special Construction works	Will require specific skills for the heavy equipment that will be involved, e.g. in pile driving works if such may be involved.
Pollution Control Supervisor	The vessel will designate a Pollution Control Supervisor who shall be trained with the environmental laws and regulations as well as the requirements of the Philippine Coast Guard.

○ OPERATION PHASE

Different set of personnel and employees will be hired during the operations phase. A total number of **2,116,800 employees** are expected to be hired. Government offices such as the City of Pasay and the Philippine Reclamation Authority (PRA) will be leased with portions of the reclaimed land and in putting up their respective buildings and operations will be hiring government employees.

Private sector business and commercial establishments will be hiring separately their personnel needs.

1.8 Indicative Project Investment Cost

At this time, the initial estimated project cost for

Raw Land Reclamation is **Php 53.9 B.**

SECTION II. KEY ENVIRONMENTAL IMPACTS

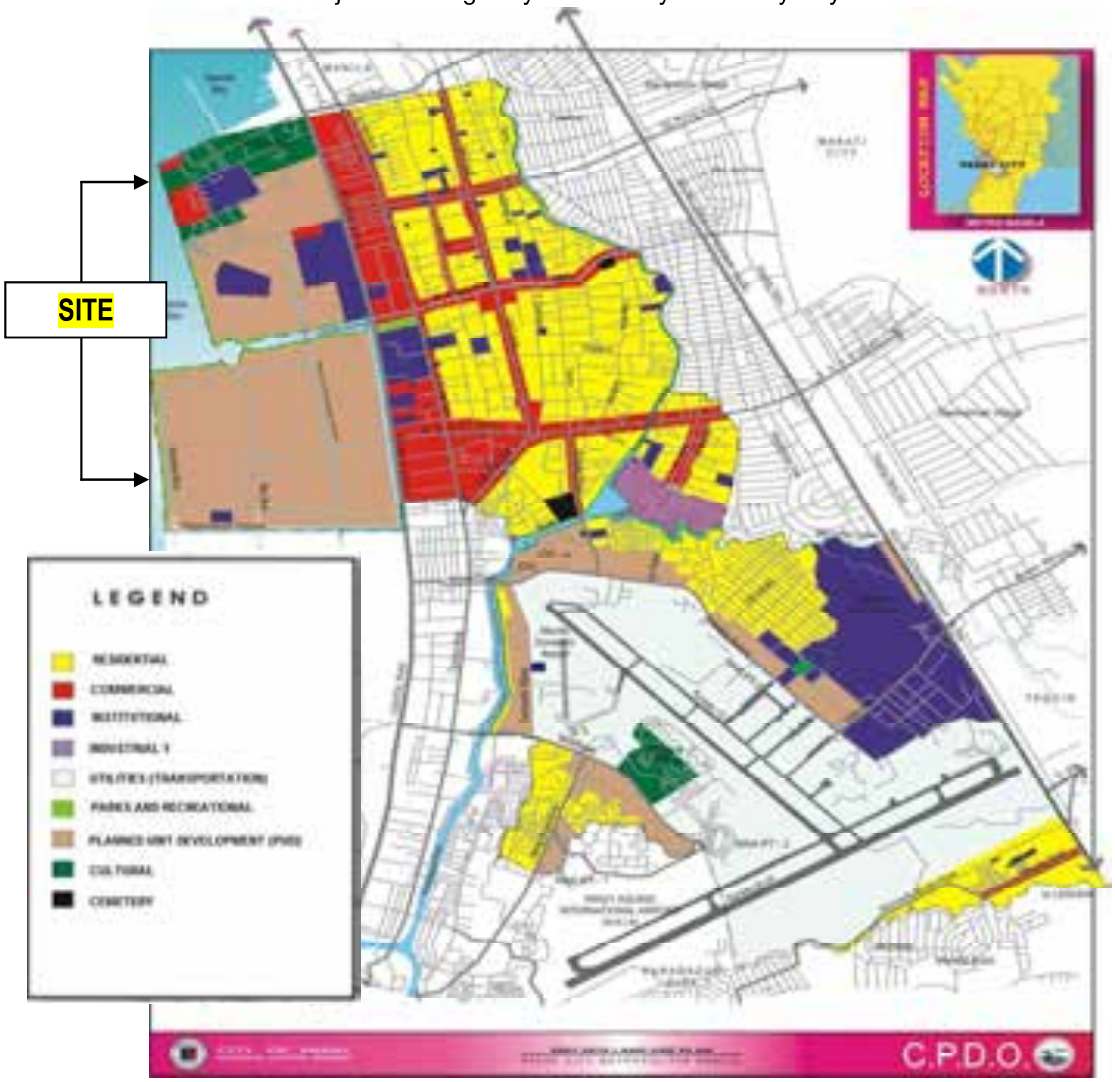
2.1 Land

2.1.1 Land Use and Classification

2.1.1.1 Change/Inconsistency in Land Use. *Description and Map Showing the Project Area in relation to existing land use. Assessment of the compatibility of the proposed project in relation to land use and/or the coastal resource management plan of the LGU*

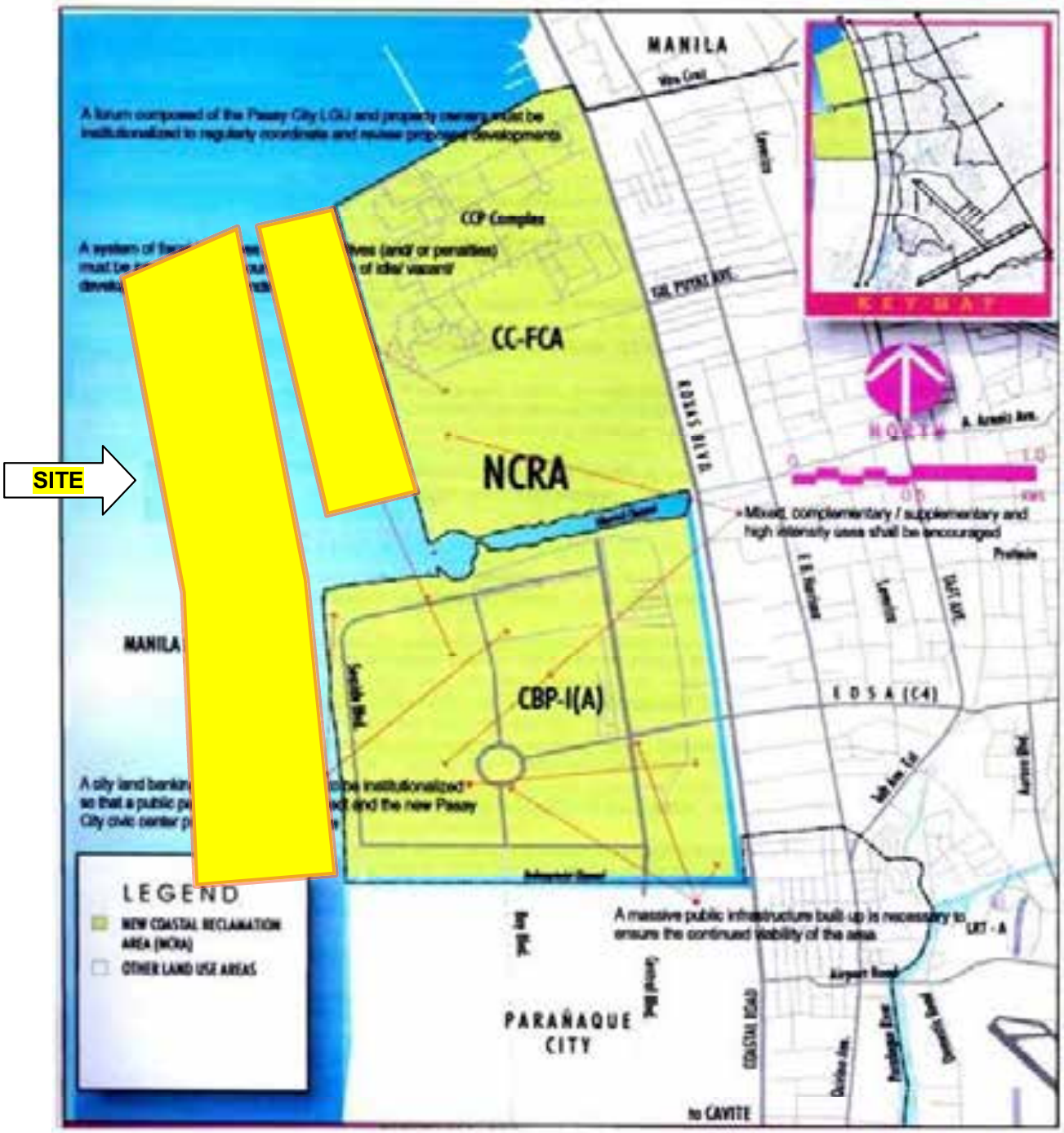
The fact alone that the project proponent is the LGU itself, the Government of the City of Pasay and that the project has been approved by the City Council obviously suggest the absence of conflict with the City's Land Use Plan and/or Coastal Resource Management Plan.

Shown in **Figure 2.1.1** is the City's Land Use Map and in **Figure 2.1.2** is the coastal reclamation areas project in Pasay. **Figure 2.1.3** shows the Old and New Coastal Reclamation Zone. **Figure 2.1.4** shows the 2013 Zoning Map wherein the Proposed Reclamation Project was originally included by the Pasay City Government.



(***Source:*** *Updated Pasay's Conceptual Master Development Plan September 2012)*

Figure 2.1.1 Land Use Map of Pasay Showing the Project Site



(Source: City of Pasay CPDO)

Figure 2.1.2 Land Use Map of the City of Pasay Showing the Coastal Reclamation Areas

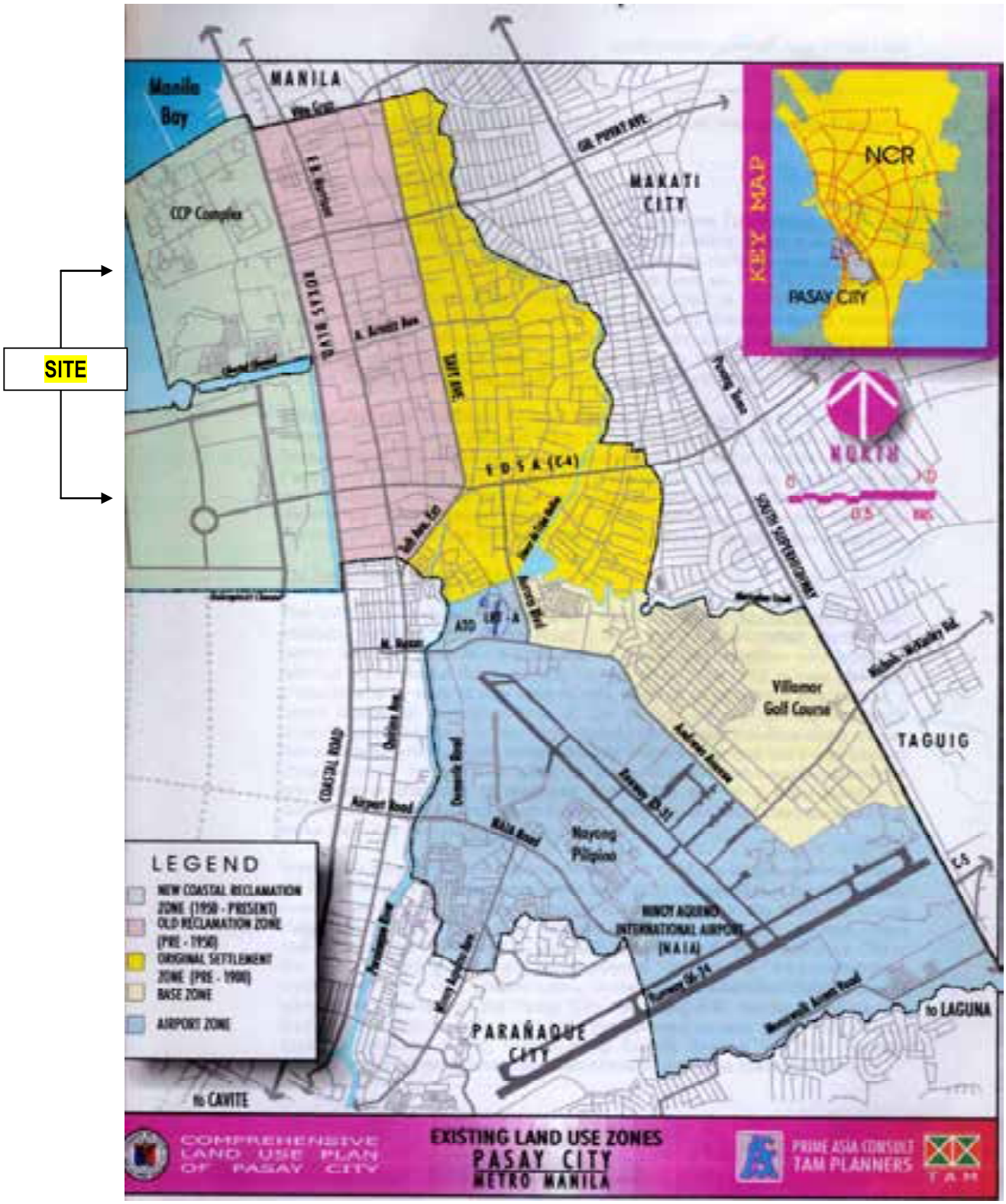


Figure 2.1.3 Existing Land Use Zones

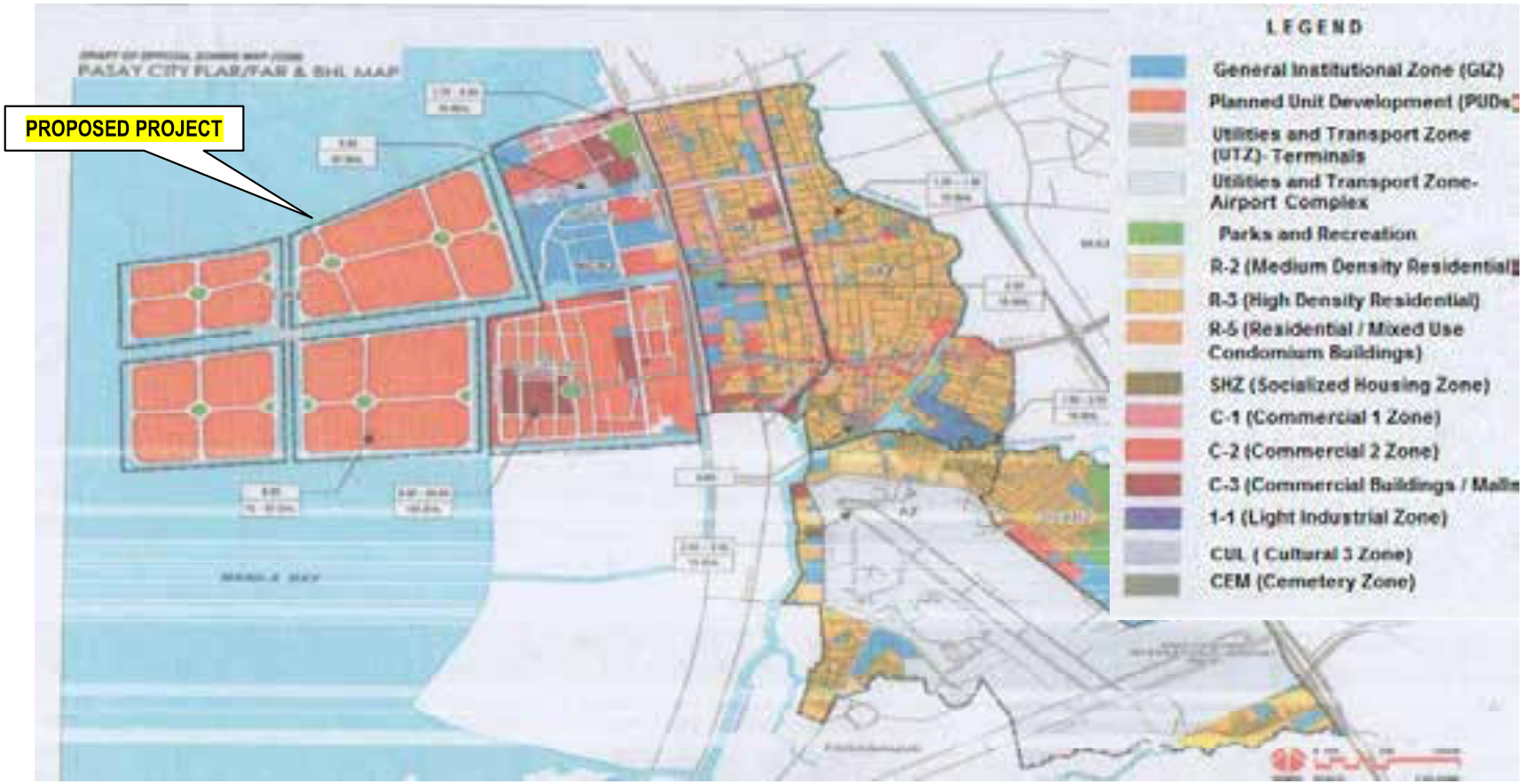


Figure 2.1.4 2013 Draft of Official Zoning Map of Pasay City

Compatibility with the Boulevard 2000 Plan

- See **Annex 15** for the **ADMINISTRATIVE ORDER NO. 224 AMENDING ADMINISTRATIVE ORDER NO. 176, "CREATING PRESIDENTIAL TASK FORCE BOULEVARD 2000".**

- **Figure 2.1.5** shows the Map Showing the Project Site in Relation to the Boulevard 2000 Plan" substantiated by **Figure 2.1.6** indicating therein the Land Use Map of the City of Pasay Showing the Coastal Reclamation Areas**.** The said figures clearly indicate the compatibility of the project with the Boulevard 2000 Plan and the Land Use Plan of the City.

Proof of Compatibility with the existing Land Use Plan (Operational Plan of Manila Bay Coastal Strategy-Manila Bay Sector of the National Reclamation Plan)

The Manila Bay Coastal Strategy (MBCS) (October 2001), stipulates among others that:

- *The MBCS provides a comprehensive environmental management framework, targeted outcomes and a series of actions/programs involving the participation of both government and non-government sectors,*

- *The geographical scope of the Coastal Strategy includes the surface area of the Bay, about 1,800 km^2.*

- *The Coastal Strategy builds upon the direction of the national and local policies, plans and programs; consolidates sectoral initiatives, and provides a forum for the interagency and multi-stakeholders information sharing and decision-making.*

It is seen from the above declaration of principles, that there are no specific prohibitions / restrictions or approval of reclamation plans with respect to the MBCS operational plan. It would be guided instead by the direction of the national and local policies.

The project will be consistent with the expressed goals and objectives of the MBCS shown in the summary matrix in **Table 2.1.1.**

Table 2.1.1 GOALS AND OBJECTIVES OF THE IDENTIFIED ISSUES/AREAS OF CONCERN

Issues/Areas of Concern	Goals	Objectives
Partnership and Governance Issues	*Promote partnerships and ensure the implementation of good environmental governance as means to achieve the sustainable development of the Manila Bay Region*	**Objective 1:** Develop, adopt and implement an integrated land use and sea use plan for the Manila Bay Region by 2012. **Objective 2:** Establish appropriate institutional arrangements to oversee, coordinate and guide the implementation of Manila Bay Coastal Strategy and Operational Plan by 2007. **Objective 3:** Develop, set-up and operationalize Integrated Coastal Area and River Basin Management system covering 100% of the Manila Bay Region by 2010.

Issues/Areas of Concern	Goals	Objectives
		Objective 4: Create awareness, build capacity and mobilize at least 50% of the coastal communities to participate in activities related to the implementation of the MBCS by 2010. **Objective 5:** Increase to at least 75% the number of LGUs within the Manila Bay region implementing development and investment programs through private sector and public-private sector partnerships by 2010. **Objective 6:** Reduce by 25% the illegal settlers, establishments and structures along coast lines by 2010 and prevent future preoccupation of these shorelines. **Objective 7:** Develop and implement a Natural Hazards Contingency, Preparedness and Quick-Response System for the Manila Bay Region by 2008. **Objective 8**: Develop and institutionalize a performance monitoring and evaluation system for Manila Bay Region by 2007.
Water Pollution	*Protect the waters in Manila Bay and its tributaries (rivers and lake) and ensure that they are safe for various uses (e.g., recreation, source of potable water, transportation, irrigation, fisheries and other living resources)*	**Objective 1:** Reduce by 50% the discharges of raw sewage, septage and untreated and inadequately treated wastewater (from commercial, industrial, agricultural, and fisheries/agriculture) by 2015. **Objective 2:** Establish integrated solid waste management programs in all LGUs by 2007. **Objective 3:** Develop and implement toxic and hazardous waste management system by 2008.

Issues/Areas of Concern	Goals	Objectives
		Objective 4: Stop sea-dumping of sewage, industrial sludge, solid waste, and contaminated dredged materials by 2008. **Objective 5:** Stop discharges of operational waste (oily bilge and ballast water) from ships and the use of anti-fouling paints with TBTs and other harmful compounds by 2006. **Objectives 6:** Activate a bay-wide, multi-sectoral oil spill prevention and response program by 2006.
Over-Exploitation of Resources and Degradation of Habitats and Historical, Cultural, Religious, Archeological and Unique Geological Sites	*Ensure protection, restoration and sustainable development of resources, habitats, natural areas, and historical, cultural religious and archeological site that are essential in achieving the ecological, social, and economic well-being of communities and stakeholders in the Manila Bay Region.*	**Objective 1:** Set-up sustainable institutional arrangements and management programs in all declared Protected Areas (Pas) and Critical Habitats in the Manila Bay Region by 2007. **Objective 2:** Implement a no net loss policy for existing mangroves, mudflats, beaches and sandy shores by 2010. **Objective 3:** Increase by "80%" the forest cover in the entire Manila Bay watershed area by 2015. **Objective 4:** Formulate and implement a restoration and maintenance program for important cultural, historical, religious and architectural landmarks and archeological and unique geological sites within the Manila Bay Region by 2010. **Objective 5:** Increase the productivity of fishery resources within the Manila Bay Region to attain the maximum sustainable yield (MSY) by 2020. **Objective 6:** Achieve sustainable and ecologically-sound aquaculture and

Issues/Areas of Concern	Goals	Objectives
		manicure production in Manila Bay by 2015. **Objective 7:** Increase coverage of water supply distribution system by 50% in areas with unsustainable groundwater extraction to protect aquifers from contamination and salt-water intrusion by 2015.

(Source: Manila Bay Environmental Management Project)

Moreover, one of the programmes of the government through the Philippine Reclamation Authority (PRA) is the Boulevard 2000 Plans. This is shown in **Figure 2.1.5**. It can be gleaned that the project is consistent with the plan.

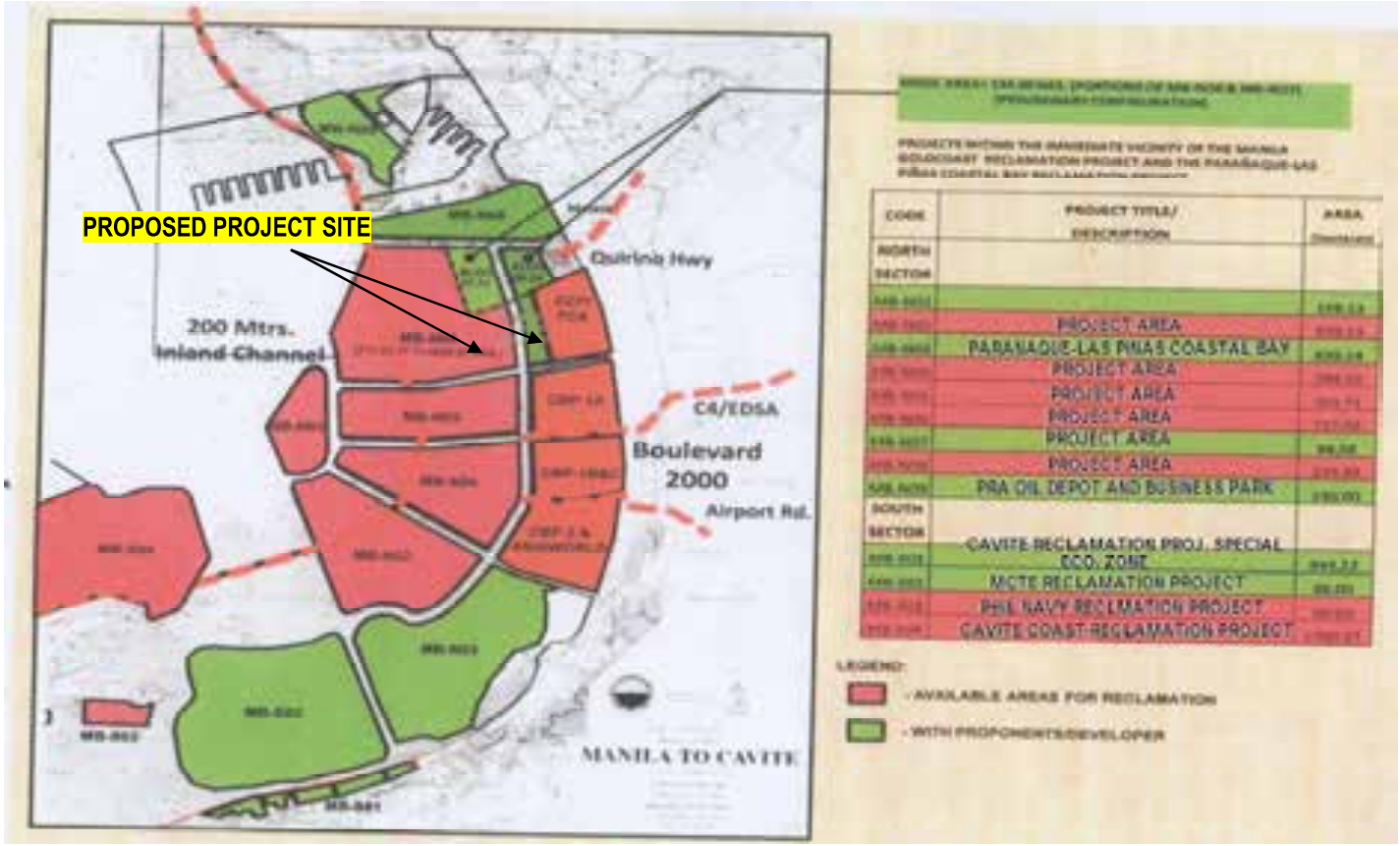


Figure 2.1.5 Map Showing the Project Site in Relation to the Boulevard 2000 Plan

****Thus the project will ensure general compliance with the MBCS.***



Source: *Pasay City CLUP*

Figure 2.1.6 Land Use Map of Pasay City Showing the Coastal Reclamation Areas

Consistency with the PRA Implementing Rules and Regulations

There are general guidelines of the PRA for reclamation projects that proponent need to comply with. More specific requirements are defined by PRA for particular projects before a Notice to Proceed (NTP) with project implementation is issued this project. **Figure 2.1.7** shows the flow chart of approvals/requirements of the PRA.

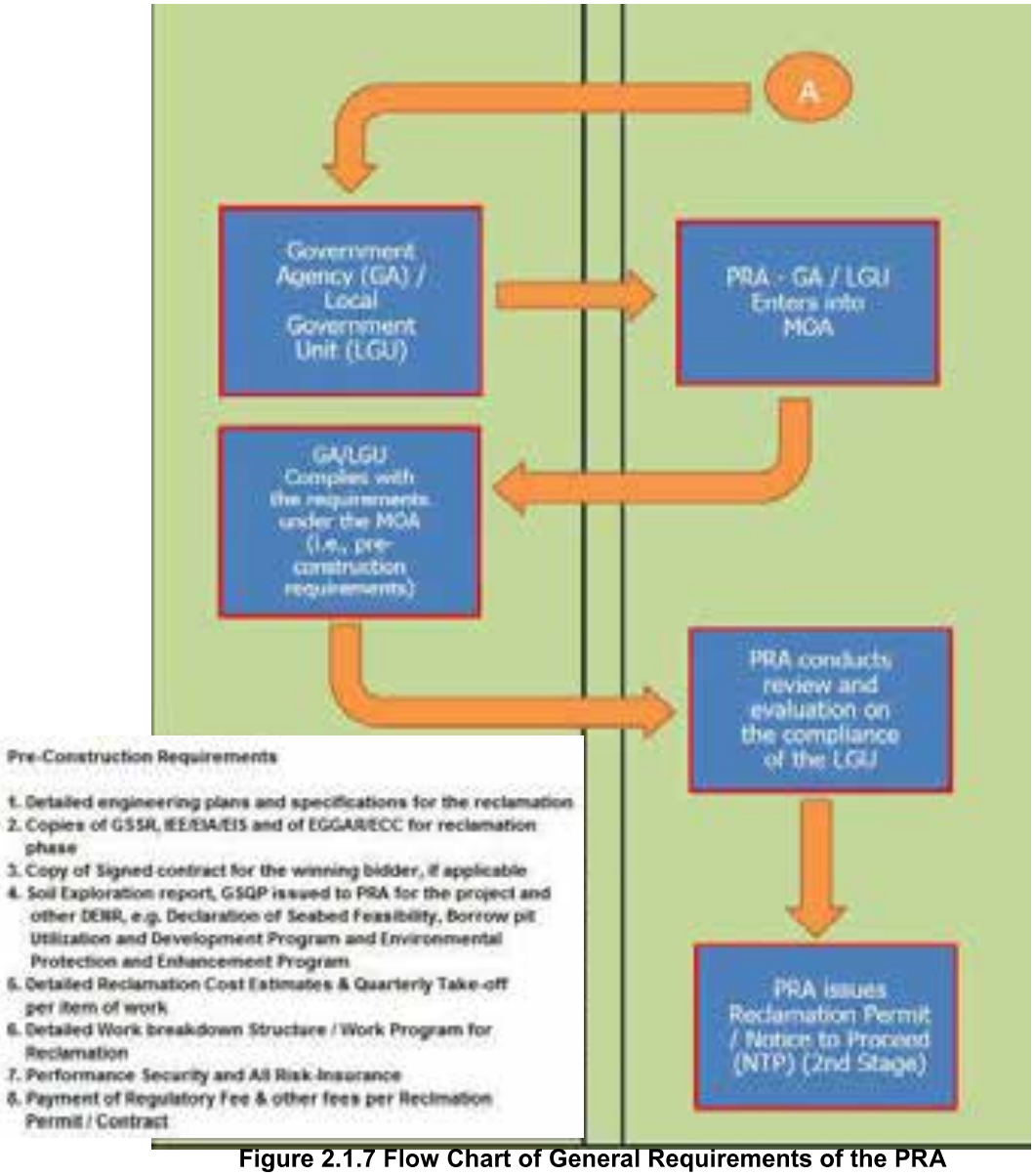


Figure 2.1.7 Flow Chart of General Requirements of the PRA

Among these requirements are:

- An Environmental Compliance Certificate
- An Area Clearance
- A Preliminary Engineering Geologic and Geoahazard Assessment Report

Key technical and engineering requirements for this Project are, but not limited to:

- Buffer or No Build zone of 200 meters from the coast to separate the project area from the existing developed area and allow for the unimpeded flow of run-off surface water from the City proper and draining into Manila Bay.

- Finished platform with a uniform elevation of +4.0 meters above mean lower low water level (MLLW);

The Project in Relation to the PRA Master Plan for Manila Bay

Shown below is the published reclamation project of PRA showing therein the plan for **26,234 hectares** of reclamation in Manila Bay.



Figure 2.1.8 Reclamation Projects in the entire Philippines

Public Statement of the PRA General Manager shown below provides another proof of compatibility

- **On reclamation and flooding**

@inquirerdotnet
Philippine Daily Inquirer
10:28 PM October 25th, 2011

The letter pointing to reclamation projects as real cause of the storm surge in Manila Bay (Inquirer, 10/3/11) has caught the attention of the Philippine Reclamation Authority (PRA). Allow us to respond to correct whatever wrong information it may have impressed on readers.

Well-designed and properly constructed reclamation projects will not cause flooding. On the contrary, they can prevent flooding by providing added protection, such as sea barriers to mitigate the effects of accelerated rising sea levels, which is a direct effect of global warming.

A storm surge is the result of the piling up of water on the ocean's surface as it is pushed by strong winds associated with low pressure weather systems such as tropical cyclones. The water during a storm surge is higher than the ordinary sea level, more so when it happens during high tide. Therefore, reclamation had nothing to do with the unfortunate confluence of strong winds and high tide that brought about the devastating rush of water into areas along the Bay.

What happened, in fact, was that the whole stretch covered by the reclamation projects under the Boulevard 2000 Plan along Roxas Boulevard—from the Cultural Center of the Philippines to the coastal road—did not suffer the same catastrophic rush of seawater, unlike the areas from the Manila Yacht Club to the US Embassy. The seawalls built to protect the reclaimed area saved the establishments and inhabitants there.

Storm surges were likewise reported to have occurred in coastal areas in Ilocos Sur and Camiguin, where there are no reclamation projects.

For any land reclamation activity, the relevant drainage outfalls and rivers are of vital concern and should be carefully examined in order to prevent the adverse effects of flooding on the main land. The reclamation projects along Manila Bay were implemented according to the Boulevard 2000 Framework Plan, which contains mandatory provisions such as the preparation of drainage plans that will satisfy technical, economic and environmental requirements. Its implementation was directed by a task force composed of various government agencies such as the Department of Public Works and Highways, the Department of Environment and Natural Resources, the Metropolitan Manila Development Authority and local governments.

Land reclamation has long been recognized in other countries not only as a viable development strategy but also as an effective water control system to protect coastal areas from devastating natural forces of the sea. Countries such as the Netherlands, Singapore, Dubai and Japan, to name a few, have all successfully embarked on reclamation to advance their economies.

—PETER ANTHONY A. ABAYA,
General Manager and Chief Executive Officer,
Philippine Reclamation Authority,
info@pea.gov.ph

The Agreement between PRA and the City of Pasay

Excerpts from the Agreement (**Annex 17.0**) are relevant to the above item are hereunder provided:

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ANTECEDENTS

Presidential Decree No. 3-A mandates that all reclamation of foreshore, submerged and offshore areas shall be limited to the National Government or any person authorized by it under a proper contract.

Executive Order No. 525, dated February 12, 1979, designates PEA as the agency primarily responsible for all reclamation projects for and in behalf of the National Government and mandates that all reclamation projects be submitted to the President for his approval, upon recommendation by the PEA and the same to be undertaken by the PEA or through a proper contract executed by it with any person or entity.

On June 24, 2006, Her Excellency President Gloria Macapagal-Arroyo issued Executive Order No. 543, delegating to the PRA the authority of the President to approve reclamation projects.

His Excellency President Benigno S. Aquino III issued on November 13, 2013 Executive Order No. 146, transferring the power to approve reclamation projects from the PRA Board to the National Economic and Development Authority (NEDA) Board.

NEDA-PRA Joint Order No. 01-2015 was issued pursuant to Section 6 of EO 146.

…..

Table 2.1.2 Compliance from execution of MOU:

YEAR 1	YEAR 2	Six (6) months From Year 2
Procurement of Consultancy Services	1. Detailed FS 2. EIS 3. EGGAR 4. No. of objection certification/s	ECC PREA Evaluation Period

==========

The above are excerpts from the MOU between the City of Pasay and the PRA. This clearly indicates that:

> The authority for the reclamation project and thus the compatibility with Proclamation 41 and the Boulevard 2000 Plan is vested on the PRA and not on the City of Pasay.
>
> The City has to secure the “No Objection Certification/s” from various agencies, e.g. the DPWH after the securing of the ECC; such Certifications are expected to be secured after the concerned Agencies shall be satisfied with the details of the City’s Reclamation Plan. These details will include the engineering aspects in respect of flooding, compatibility with the Manila Bay Coastal Strategy (MGCS) and other similar features of the Project.
>
> Copy of the signed MOA is given in **Annex 17.0.**

Continuing Supreme Court Mandamus on Manila Bay

The Continuing Mandamus provides certain guidelines for project implementation, e.g. the construction of Waste Water Treatment Facilities to assure compliance with the effluent standards (during the Operations Phase) consistent with the Manila Bay Classification.

There are no provisions in the Mandamus that directly gives restrictions on the project.

A cursory discussion of the Mandamus is made below, details provided in **Annex 4.**

RULE 8 of the Supreme Court Rules of Procedure for Environmental Cases, effective April 2010 stipulates the following:

"WRIT OF CONTINUING *MANDAMUS*

SECTION 1. *Petition for continuing mandamus.*—When any agency or instrumentality of the government or officer thereof unlawfully neglects the performance of an act which the law specifically enjoins as a duty resulting from an office, trust or station in connection with the enforcement or violation of an environmental law rule or regulation or a right therein, or unlawfully excludes another from the use or enjoyment of such right and there is no other plain, speedy and adequate remedy in the ordinary course of law, the person aggrieved thereby may file a verified petition in the proper court, alleging the facts with certainty, attaching thereto supporting evidence, specifying that the petition concerns an environmental law, rule or regulation, and praying that judgment be rendered commanding the respondent to do an act or series of acts until the judgment is fully satisfied, and to pay damages sustained by the petitioner by reason of the malicious neglect to perform the duties of the respondent, under the law, rules or regulations……"

In addition in its decision (*G.R. Nos. 171947-48)* the Supreme Court issued with finality the Mandamuspertinent/partial ruling as follows.

WHEREFORE, judgment is hereby rendered ordering the above named defendant-government agencies to clean up, rehabilitate, and preserve Manila Bay, and restore and maintain its waters to SB level (Class B sea waters per Water Classification Tables under DENR Administrative Order No. 34 [1990]) to make them fit for swimming, skin-diving, and other forms of contact recreation.

In particular:

(1) Pursuant to Sec. 4 of EO 192, assigning the DENR as the primary agency responsible for the conservation, management, development, and proper use of the country's environment and natural resources, and Sec. 19 of RA 9275, designating the DENR as the primary government agency responsible for its enforcement and implementation, the DENR is directed to fully implement its Operational Plan for the Manila Bay Coastal Strategy for the rehabilitation, restoration, and conservation of the Manila Bay at the earliest possible time. It is ordered to call regular coordination meetings with concerned government departments and agencies to ensure the successful implementation of the aforesaid plan of action in accordance with its indicated completion schedules.

(2)…… the DILG, in exercising the President's power of general supervision and its duty to promulgate guidelines in establishing waste management programs under Sec. 43 of the Philippine Environment Code (PD 1152), shall direct all LGUs in Metro Manila, Rizal, Laguna, Cavite, Bulacan, Pampanga, and Bataan to inspect all factories, commercial establishments, and private homes along the banks of the major river systems in their respective areas of jurisdiction, such as but not limited to the Pasig-Marikina-San Juan Rivers, the NCR (Parañaque-Zapote, Las Piñas) Rivers, the Navotas-Malabon-Tullahan-Tenejeros Rivers, the Meycauayan-Marilao-Obando (Bulacan) Rivers, the Talisay (Bataan) River, the Imus (Cavite) River, the Laguna De Bay, and other minor rivers and waterways that eventually discharge water into the Manila Bay; and the lands abutting the bay, to determine whether they have wastewater treatment facilities or hygienic septic tanks as prescribed by existing laws, ordinances, and rules and regulations. If none be found, these LGUs shall be ordered to require non-complying establishments and homes to set up said facilities or septic tanks within a reasonable time to prevent industrial wastes, sewage water, and human wastes from flowing into these rivers, waterways, esteros, and the Manila Bay, under pain of closure or imposition of fines and other sanctions.

(3) …. the MWSS is directed to provide, install, operate, and maintain the necessary adequate waste water treatment facilities in Metro Manila, Rizal, and Cavite where needed at the earliest possible time.

(4) …. the LWUA, through the local water districts and in coordination with the DENR, is ordered to provide, install, operate, and maintain sewerage and sanitation facilities and the efficient and safe collection, treatment, and disposal of sewage in the provinces of Laguna, Cavite, Bulacan, Pampanga, and Bataan where needed at the earliest possible time.

(5) …. the DA, through the BFAR, is ordered to improve and restore the marine life of the Manila Bay. It is also directed to assist the LGUs in Metro Manila, Rizal, Cavite, Laguna, Bulacan, Pampanga, and Bataan in developing, using recognized methods, the fisheries and aquatic resources in the Manila Bay.

(6) The PCG…and the PNP Maritime Group…in coordination with each other, shall apprehend violators of PD 979, RA 8550, and other existing laws and regulations designed to prevent marine pollution in the Manila Bay.

(7) …the PPA is ordered to immediately adopt such measures to prevent the discharge and dumping of solid and liquid wastes and other ship-generated wastes into the Manila Bay waters from vessels docked at ports and apprehend the violators.

(8) The MMDA, as the lead agency and implementor of programs and projects for flood control projects and drainage services in Metro Manila, in coordination with the DPWH, DILG, affected LGUs, PNP Maritime Group, Housing and Urban Development Coordinating Council (HUDCC), and other agencies, shall dismantle and remove all structures, constructions, and other encroachments established or built in violation of RA 7279, and other applicable laws along the Pasig-Marikina-San Juan Rivers, the NCR (Parañaque-Zapote, Las Piñas) Rivers, the Navotas-Malabon-Tullahan-Tenejeros Rivers, and connecting waterways and esteros in Metro Manila. The DPWH, as the principal implementor of programs and projects for flood control services in the rest of the country more particularly in Bulacan, Bataan, Pampanga, Cavite, and Laguna, in coordination with the DILG, affected LGUs, PNP Maritime Group, HUDCC, and other concerned government agencies, shall remove and demolish all structures, constructions, and other encroachments built in breach of RA 7279 and other applicable laws along the Meycauayan-Marilao-Obando (Bulacan) Rivers, the Talisay (Bataan) River, the Imus (Cavite) River, the Laguna De Bay, and other rivers, connecting waterways, and esteros that discharge wastewater into the Manila Bay.

In addition, the MMDA is ordered to establish, operate, and maintain a sanitary landfill, as prescribed by RA 9003, within a period of one (1) year from finality of this Decision. On matters within its territorial jurisdiction and in connection with the discharge of its duties on the maintenance of sanitary landfills and like undertakings, it is also ordered to cause the apprehension and filing of the appropriate criminal cases against violators of the respective penal provisions of RA 9003,[1] Sec. 27 of RA 9275 (the Clean Water Act), and other existing laws on pollution.

(9) The DOH …shall determine if all licensed septic and sludge companies have the proper facilities for the treatment and disposal of fecal sludge and sewage coming from septic tanks. The DOH shall give the companies, if found to be non-complying, a reasonable time within which to set up the necessary facilities under pain of cancellation of its environmental sanitation clearance.

(10) …the DepEd shall integrate lessons on pollution prevention, waste management, environmental protection, and like subjects in the school curricula of all levels to inculcate in the minds and hearts of students and, through them, their parents and friends, the importance of their duty toward achieving and maintaining a balanced and healthful ecosystem in the Manila Bay and the entire Philippine archipelago.

(11) The DBM shall consider incorporating an adequate budget in the General Appropriations Act of 2010 and succeeding years to cover the expenses relating to the cleanup, restoration, and preservation of the water quality of the Manila Bay, in line with the country's development objective to attain economic growth in a manner consistent with the protection, preservation, and revival of our marine waters.

---

[1] Among the prohibited and penalized acts under Sec. 48 of RA 9003 are: (1) littering and dumping of waste matters in public places; (2) open burning of solid wastes; (3) squatting in open dumps and

landfills; (4) transporting and dumping in bulk of collected domestic, industrial, commercial and institutional wastes in areas other than centers and facilities prescribed under the Act; (5) construction or operation of waste management facilities without an Environmental Compliance Certificate; and (6) construction or operation of landfills or any waste disposal facility on any aquifer, groundwater reservoir or watershed area.

A summary table of the consistency of the Project with various laws, regulations and issuances is summarized in **Table 2.1.4** from which may be gleaned that for the purpose of making an application for an Environmental Compliance Certificate (ECC) there are no constraints therefor.

Identification of areas vulnerable/susceptible to natural hazards where the project is located or near the project area

This is discussed in **Section 2.1.2.4**.

2.1.1.2 Encroachment in Environmentally Critical Areas (ECAs)

"ECAs" are delineated with regards to the perspective of Presidential Proclamation 2146 and of that of RA 7586 on the National Integrated Protected Area Systems

Environmentally Critical Areas (ECAs)

The intent of declaration of ECAs is that projects within ECAs must secure an ECC, as stipulated in PD 1586 below.

> *PD 1586 ESTABLISHING AN ENVIRONMENTAL IMPACT STATEMENT SYSTEM INCLUDING OTHER ENVIRONMENTAL MANAGEMENT RELATED MEASURES AND FOR OTHER PURPOSES, stipulates*
>
> *Section 4. Presidential Proclamation of Environmentally Critical Areas and Projects. - The President of the Philippines may, on his own initiative or upon recommendation of the National Environmental Protection Council, by proclamation declare certain projects, undertakings or areas in the country as environmentally critical. No person, partnership or corporation shall undertake or operate any such declared environmentally critical project or area without first securing an Environmental Compliance Certificate issued by the President or his duly authorized representative. For the proper management of said critical project or area, the President may by his proclamation reorganized such government offices, agencies, institutions, corporations or instrumentalities including the realignment of government personnel, and their specific functions and responsibilities.*

Relative to the above Presidential Proclamation No. 2146 of December 14, 1981 below are the listed twelve (12) categories of ECA. Each category are noted the relevance of the site.

1. All areas declared by law as national parks, watershed reserves, wildlife preserve and sanctuaries;
2. Areas set aside as aesthetic potential tourist spots;
3. Areas which constitute the habitat for any endangered or threatened species of Indigenous Philippine Wildlife (flora and fauna);
4. Areas of unique historic, archaeological, or scientific interests;
5. Areas which are traditionally occupied by cultural communities or tribes;
6. **Areas frequently visited and/or hard-hit by natural calamities geologic hazards, floods, typhoons,** volcanic activity, etc.
7. Areas with critical slopes;
8. Areas classified as prime agricultural lands;

9. Recharged areas of aquifers;
10. Water bodies characterized by one or any combination of the following conditions;
a. tapped for domestic purposes;
b. within the controlled and/or protected areas declared by appropriate authorities;
c. which support wildlife and fishery activities.
11. Mangrove areas characterized by one or any combination or the following conditions
a. with primary pristine and dense young growth;
b. adjoining mouth of major river systems;
c. near or adjacent to traditional productive fry or fishing grounds;
d. which act as natural buffers against shore erosion, strong winds and storm floods;
e. on which people are dependent for their livelihood.
12. Coral reef characterized by one or any combination of the following conditions:
a. with 50% and above live coral line cover;
b. Spawning and nursery grounds for fish;
c. Which act as natural breakwater of coastlines

Thus, following the above criteria, especially Criteria No. 6 (typhoons), the project site is considered an ECA.

The designation of ECAs was meant to set the guidelines for the EIA system and protocols/procedures for projects in these areas and not necessarily for restriction or prohibition of activities/projects therein.

The NIPAS

On the other hand, protected areas are designated under the National Integrated Protected Areas Systems (NIPAS). Restrictions or prohibitions of activities in Protected Areas fall under the NIPAS.

There are no protected or proclaimed areas/sites within the Project Location; this may be gleaned from the list of Protected Areas below as well as from **Figure 2.1.9** and **2.1.10**.

As of 2012, there are 240 protected areas in the Philippines covering a total area of 35,700 square kilometers equivalent to 11.9% of the Philippines' total land area. However, the project site is not included as among the ECAs in any of the following categories:

- **Sites under the Scope of the Ramsar Convention**

The Convention on Wetlands or Ramsar Convention is an intergovernmental treaty officially named the Convention on Wetlands of International Importance especially as Waterfowl Habitat. Its original emphasis was on the conservation and wise use of wetlands primarily to provide habitat for water birds.

The site of the wetlands in the Philippines covered by this Convention is:

The **Olango Island in Lapu-lapu, Cebu** (5,820 hectares) is used by millions of shorebirds as a resting place enroute from Siberia and northern Japan to Southeast Asia and Australia. These migratory birds come to this waterfowl haven to escape the fierce winter in northern Asia. Each year Olango sees nearly a hundred different species of birds, a number of which are migratory. Among the frequent guests are Chinese egrets, Asiatic dowitchers, Eastern curlews, plovers, and sandpipers.

Naujan Lake National Park in Oriental Mindoro (14,568 ha) is the fifth largest lake in the Philippines (14km by 7km); it is volcanic in origin and receives water from local run-off with no

major effluents. There are large areas of shallow water with an abundant growth of aquatic vegetation.

The Agusan Marsh Wildlife Sanctuary (14,836 ha) includes a vast complex of freshwater marshes and water-courses with numerous shallow lakes and ponds in the upper basin of the Agusan River and its tributaries, which rise in the hills of eastern Mindanao. Some parts of the marsh have been converted into fish ponds and rice paddies.

Tubbataha Reefs National Marine Park (33,200 ha), located in the middle of the Central Sulu Sea about 150 kilometers southeast of Puerto Princesa City, is well-known amongst fishermen in the southern Philippines and scuba divers around the world. Some 46 coral genera and more than 300 coral species have been recorded, as well as at least 40 families and 379 species of fish. Sea turtles, sharks, tuna, dolphins, and jackfish are also found in the reefs. The Park was inscribed in UNESCO's World Heritage list in 1993.

Puerto Princesa Subterranean River National Park in Palawan (22,202 ha) is unique in the biogeographic region because it connects a range of important ecosystems from the mountain-to-the-sea, including a limestone karst landscape with a complex cave system, mangrove forests, lowland evergreen tropical rainforests, and freshwater swamps. It is home to about 800 plant and 233 animal species, including the critically endangered Philippine cockatoo (*Cacatua haematuropygia*) and Hawksbill turtle (*Eretmochelys imbricate*), as well as the endangered Green sea turtle (*Chelonia mydas*) and Nordmann's greenshank (*Tringa guttifer*).

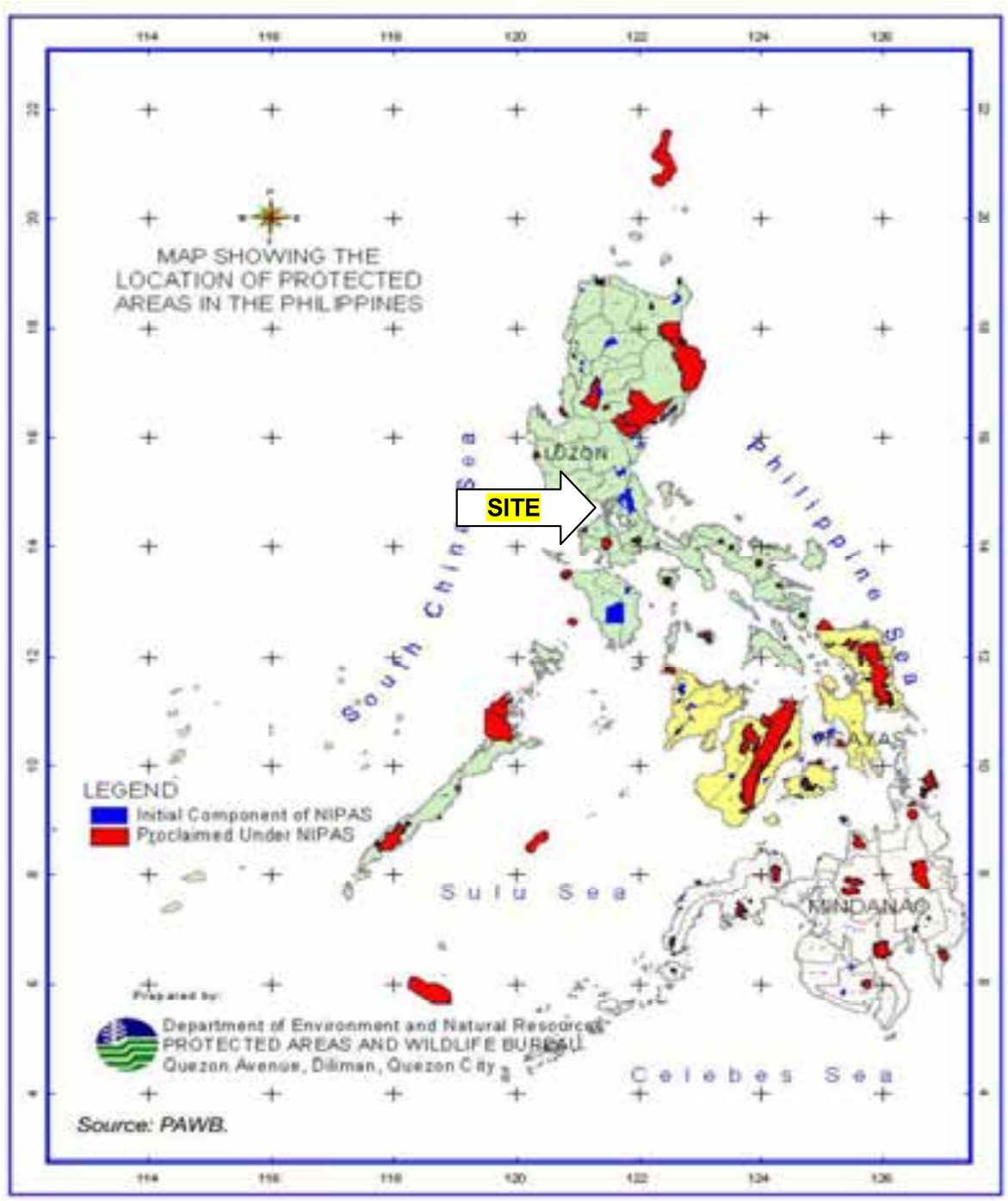
The **Las Piñas-Parañaque Critical Habitat and Ecotourism Area (LPPCHEA)** is a 175-hectare coastal urban wetland and bird sanctuary situated within the metropolis of Metro Manila, comprising two interconnected, mangrove-covered islands, shallow lagoons and coastline. A Presidential Proclamation in 2007 designated the site as a 'Critical Habitat' for the survival of threatened, restricted-range and congregatory species. At least 5,000 individuals of migratory and resident birds have been recorded at the site, including the vulnerable resident bird species Philippine Duck (*Anas luzonica*) which breeds at the site.

The wetland nearest the site which is classified as a Protected Area is the **Las Piñas-Parañaque Critical Habitat and Ecotourism Area (LPPCHEA)**. A summary of the compatibility with Protected Areas is provided below.

Table 2.1.3 Summary of Compatibility with Protected Areas

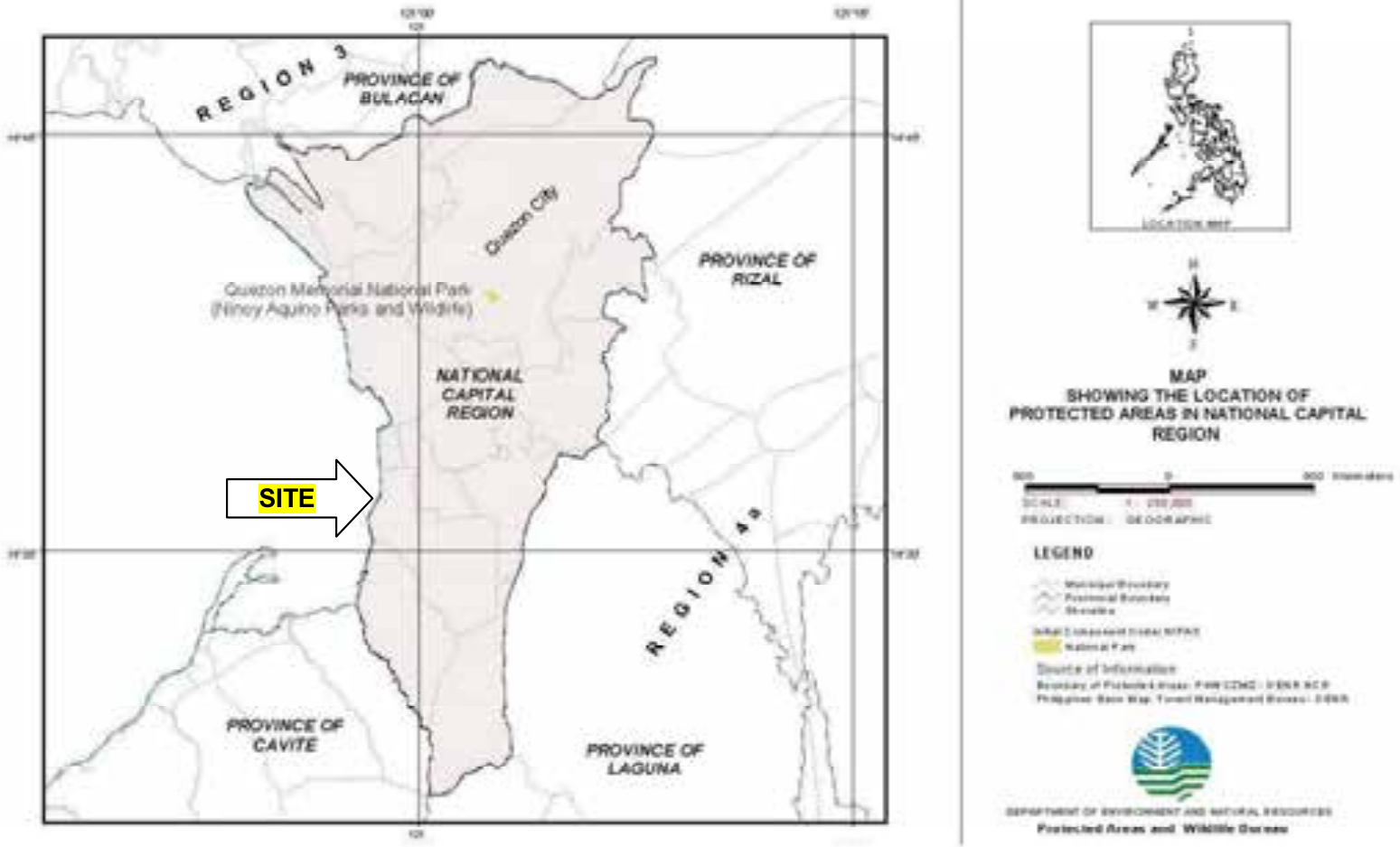
Classification of Protected Areas	Applicability to Project Site
National Parks	Project site is in water Not Applicable
Natural Mountains	The Reclamation Project is a project of the Philippine Government through the Philippine Reclamation Authority under the Office of the President. As a matter of protocol prior to issuance of the *Notice to Proceed* with Project Implementation, the PRA necessarily seeks *Letters of No-Objection* from various agencies which will include those with authority over Protected Areas, Parks, and Monuments. Adjacent Reclamation Projects have been granted not only ECCs but also Letters of No Objection.
Protected Seascapes	No proclamation

Classification of Protected Areas	Applicability to Project Site
Protected Landscapes	Not applicable
Game Refuge and Bird Sanctuaries	Bird Sanctuary is at the Las Pinas-Paranaque boundary although exotic and rare bird species sighted hovering over the site and immediate vicinity.
Managed Resource Protected Areas	None
Marine Reserves	None
Watershed Forest Reserves	None
Natural Biotic Areas	Not Applciable
Wilderness Areas	Not Applicable



SOURCE: La Viña , Antonio G.M. et al., (14 March 2010). Legal Framework for Protected Areas: Philippines . Retrieved from http://cmsdata.iucn.org/downloads/philippines.pdf. August 11, 2014

Figure 2.1.9 Map of the Protected Areas in the Philippines



SOURCE: http://bmb.gov.ph/images/stories/maps/ncr_map.jpg. Retrieved on August 11, 2014

Figure 2.1.10 Map of the Protected Areas in NCR

Additional Premises on Legal Personality of the City of Pasay and on Compatibility with Laws

The 360-hectare Reclamation Project is being pursued by and the application for an ECC is under the name of the proponent i.e. the City of Pasay.

The authority and responsibility for reclamation projects directly rest on the Philippine Reclamation Authority (PRA) which is now under the administrative supervision of the NEDA.

The City of Pasay in effect is to comply with the requirements of the PRA as embodied in the Agreement the Parties signed to.

Transfer of an ECC

Under the PEISS an ECC may be duly and legally transferred to another juridical personality subject to approval by the EMB/DENR and to other conditions.

On Proclamation 41 dated July 5 1954 (See Annex 7).

The spirit behind the proclamation is seen to be preservation of parks and wildlife by the Commission on Parks and Wildlife.

The project is not incompatible with the Proclamation and is in fact not relevant to it for the following reasons:

- There are no parks and wildlife in the project site
- The authority over the project site which is portion of the sea body is on the City of Pasay
- The CLUP of the City does not see issues vis-à-vis Proclamation 41.
- There have been reclamation works in the boundaries of the proclaimed parks and wildlife

Not with standing the above the following action plan will be undertaken by the City of Pasay:

- Comply with the normal post-ECC condition of the PRA before a proponent can be issued a Notice-to-Proceed (NTP) for construction works which generally involves seeking No-Objection from concerned governmental authorities. It is significant to note that the NTP of the PRA is subject to clearance by the Office of the President through the NEDA.

- In the Environmental Management Plan (EMP) the proponent will institute measures that will preserve or enhance the environmental soundness of the project site.

A general summary of compatibility for the project with various rules/issuances and policies is shown in **Table 2.1.4.**

Table 2.1.4 Summary of Compliances to and Consistencies with Various Regulations/Laws/Treatises

Regulations/Laws/Issuances	Consistency With and Compliance To
Comprehensive Land Use Plan (CLUP)	Reclamation Included/Identified in CLUP LGU which issues CLUP is itself Project Proponent
Manila Bay Coastal Strategy (MBCS)	Policies and Guidelines of MBCS to be complied with
Boulevard 2000 Plan	Project Site Within the Master Plan of Boulevard 2000.
PRA Guidelines	Consistent with General Guidelines Specific Guidelines to be Defined when Proponent applies for Notice to Proceed (NTP) from PRA; one of requirements for NTP is an ECC
Supreme Court Mandamus on Manila Bay	Mandamus serves as guideline for EMP Mandamus itself does not directly restrict reclamation projects in Manila Bay
Environmental Critical Area of the NIPAS	Project not in conflict
Ramsar Convention	Site is **NOT** within Project included in the Convention

2.1.1.3 Possible tenurial / water issue

Other conflicting tenurial/water issues (eg. ROW, informal settlers etc.)

The project site is not being used at present in any of the following water-based activities or projects:

- As navigational lane.
- As areas for significant or commercial fishing.
- As port.
- As a water-based settlement (e.g. boat people).
- As a source of bulk water supply.
- As a source of commercial/economic supply of fish and other marine species.

2.1.1.4 Possible conflicts with the nearby cities involving use or access to rivers within the site and vicinity.

The project does not conflict with the use or access to waterways and rivers within the site and its immediate vicinity (See **Figure 2.1.11)**. Based on the figure, the site is not located in the alignments of and is distant from these waterways and water bodies hence the said impact is not perceived.



Figure 2.1.11 Maps Showing the Channels and Rivers nearest the Project Site

Present conditions of the areas shown in the above map.

- Waterways

The fishing lift nets along navigational lane for the dredging vessel from the project site to the San Nicholas Shoal are located in the Bacoor, Cavite area. The present conditions may be gleaned from typical photograph of the lift nets, shown in **Plate 2.1.1.**

Plate 2.1.1 Photograph of typical lift net near Bacoor, Cavite



The Libertad Channel

The channel is a man-made drainage system. Photographs of the Libertad Channel are shown in **Plates 2.1.2** showing therein the present condition of Libertad Channel; also seen in **Plate 2.1.3** are the fishing boats docked at the Channel near the Diokno Street.

Plate 2.1.2 The Libertad Channel showing present conditions



Plate 2.1.3 Fish Boats Anchored at the Libertad Channel



Conditions of the Adjacent Waterways

Plates 2.1.4 depict the typical conditions of these man-made waterways which were constructed to serve as drainage systems.

Plate 2.1.4 Drainage system at the Redemptorist Bridge South of Project Site



2.1.2 Geology/Geomorphology

2.1.2.1 Change in surface landform/topography/terrain/slope; *Slope and Elevation/Topographic. Map Change in sub-surface geology*

These are taken to refer to the sea bed bottom and to the bathymetry at the project sites. The bathymetric maps are shown in **Figure 2.1.12 to 2.1.13 and 2.1.14**. The sub-surface geology will experience changes but in the nature of enhancement because of the replacement of portion of the sea bed with fill materials. The extent will depend on the details of the reclamation methodology and works which will dictated by the geotechnical investigation that will be conducted.

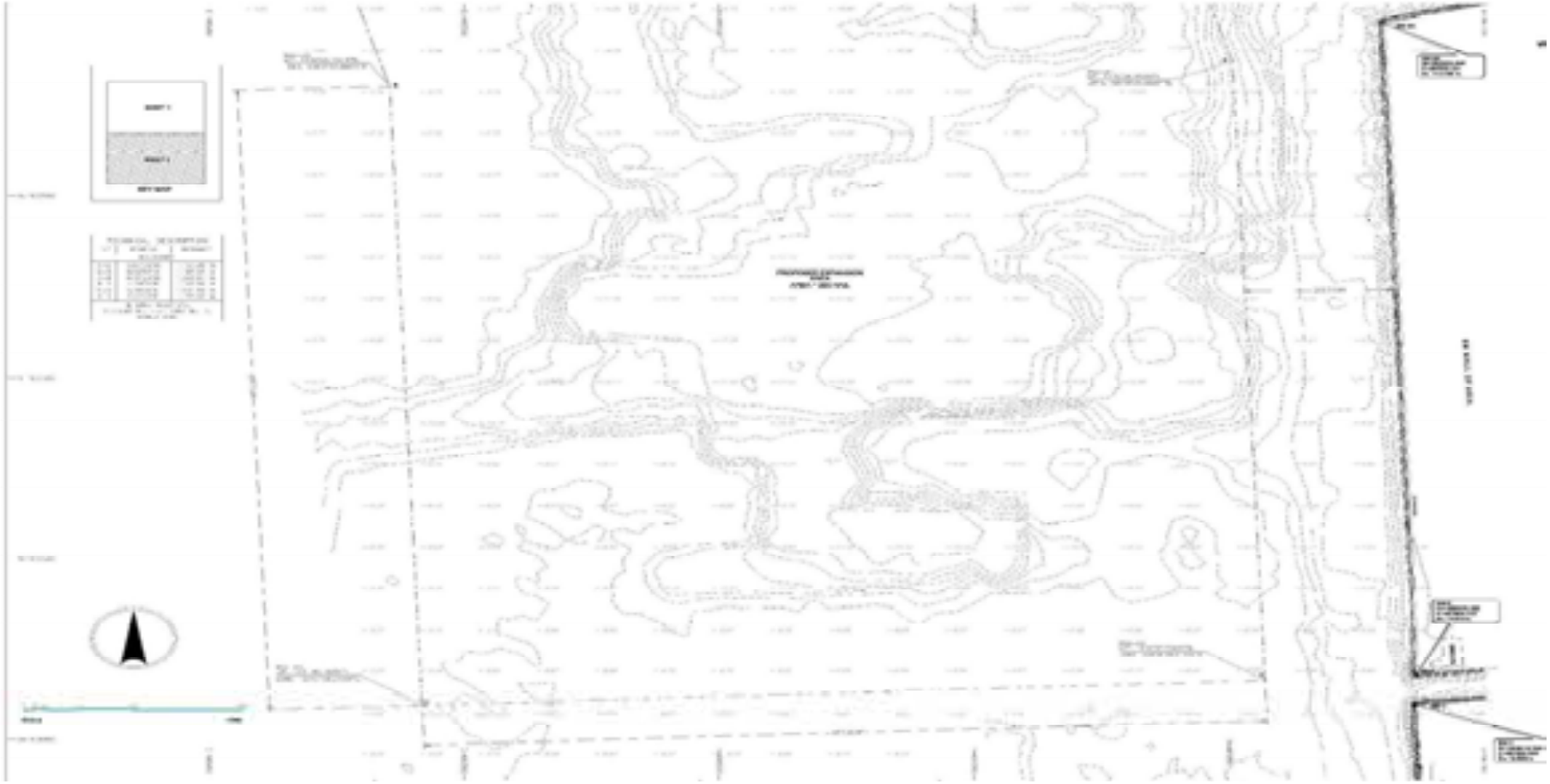


Figure 2.1.12 Bathymetric Map of the 300-Hectare Reclamation Site

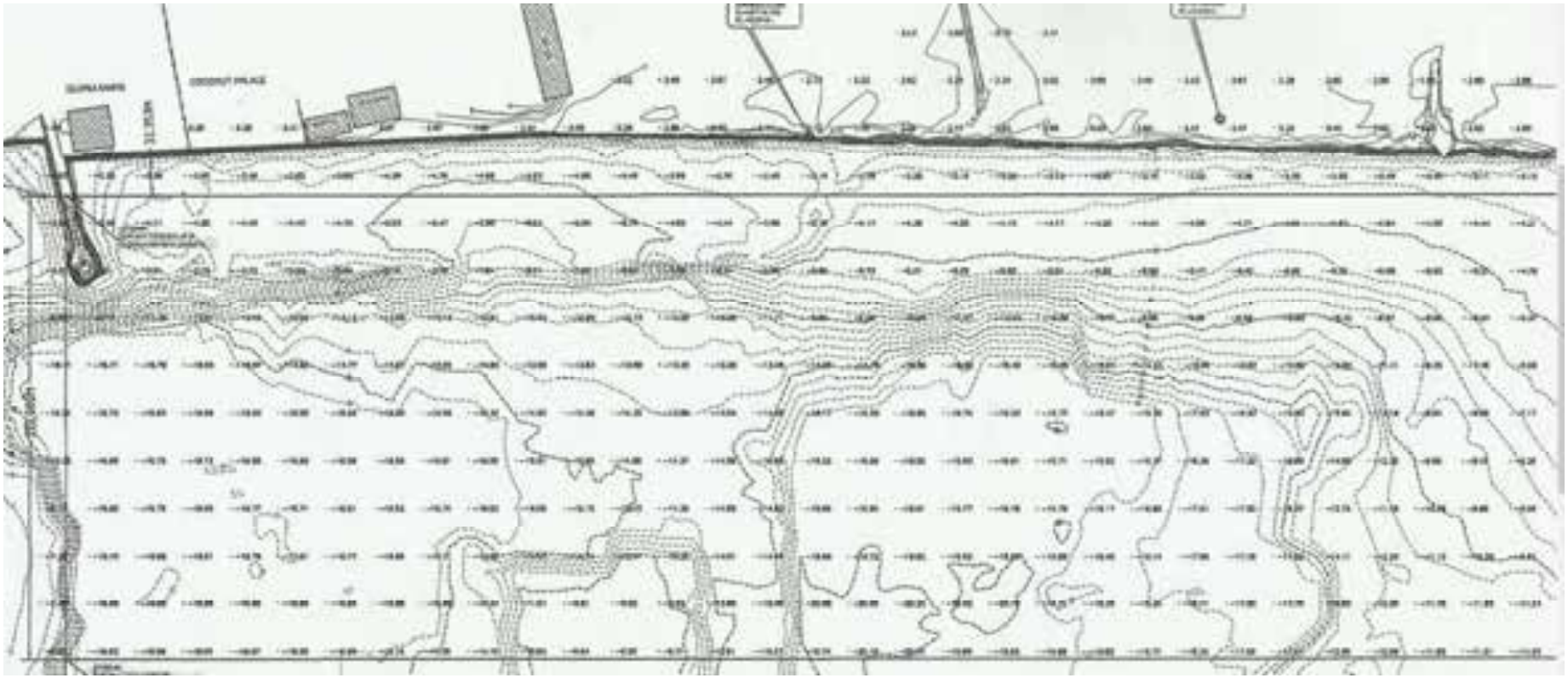


Figure 2.1.13 Bathymetric Map of the 60-Hectare Reclamation Site

See Attached Enlarged Map

Figure 2.1.14 Consolidated Bathymetric Map of the 60 Hectare and 300 Hectare Reclamation Site

2.1.2.2 Tectonic Setting

Geologic Setting

The Philippine Island Chain has evolved from the collision between the Eurasian Plate, South China Sea Plate, the Philippine Sea Plate, and the Pacific Plate. The collision resulted to several subduction zones marked by oceanic trenches. The development of the archipelago was caused by the active squeezing and magma rise producing a chain of volcanoes from the remelting of the subducting lithosphere.

The Philippine Sea Plate is being subducted on the east side of the archipelago along the Philippine Trench and the East Luzon Trench. On the other side of the archipelago, the seafloor of the South China Sea Plate subducts near the west side of Luzon along the Manila Trench, producing an opposite dipping subduction zone. On the southwest, the seafloor of the Sulu Plate subducts near the west side of Negros Island along the Negros Trench and along Sulu Trench near the northwest side of Zamboanga. The Celebes Sea Plate subducts near the west side of Central Mindanao along the Cotabato Trench and in Davao Gulf along the Davao Trench.

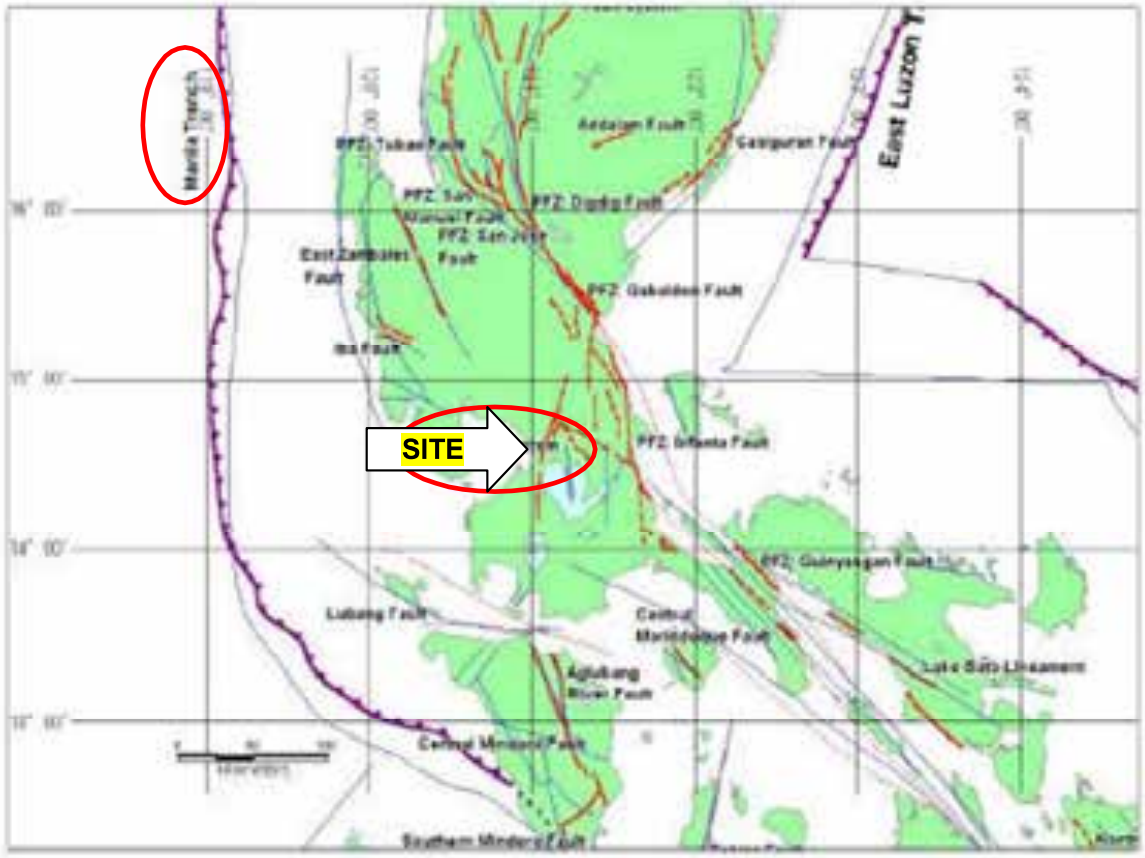
As a result of the colliding and subducting plates, a broad zone of active deformation characterized by pronounced seismicity and volcanism runs longitudinally throughout the entire length of the archipelago. Convergence is farther absorbed by internal deformation along the 1,600 kilometers long Philippine Fault, a major strike-slip fault extending from Lingayen to Davao.

Metro Manila lies on the western central part of the island of Luzon within the so-called “Philippine Mobile Belt” (PMB), a mobile and highly seismic belt that transects the archipelago. The Philippine Mobile Belt, especially along the Philippine Fault Zone (PFZ), absorbs the continuing crustal plate deformation. The Philippine Fault Zone, a 1,600-kilometers long strike-slip fault that sinuously trends north to northwest from Luzon to Mindanao transects the Philippine archipelago.

About one-third of the destructive earthquakes that have affected Metro Manila and vicinity were generated from the Philippine Fault Zone. The movement of the Philippine Fault Zone produced the majority of the most devastating earthquakes in the Philippine history including the 16 July 1990 earthquake event. The 1990 earthquake generated from the PFZ’s northern segment, the Digdig Fault, was recorded at Ms 7.8.

The project site is found about 8.00 kilometers west of the western extension of the Valley Fault System, a geomorphologically active fault that extends southward along the Marikina Valley to Western Laguna and gradually curves towards the west as it approached the Batangas-Cavite boundary at Tagaytay Ridge. Recent investigation by PHIVOLCS along the Sucat-Muntinlupa-Alabang stretch have confirmed the existence of creep (active fault movement) along what is believed to be a step-over segment of the fault there (Rimando et al, 1995).

Other significant geologic structures in the region include the Philippine Fault Zone and its branches and Lubang Fault found between Batangas and Mindoro Island and Manila Trench found west of Luzon Island.



Source: http://www.ndrrmc.gov.ph/attachments/020_E_SUMMARY_02.PDF. Retrieved on September 2014

Figure 2.1.15 Map Showing the Locations of the Manila Trench and the WVF System in Relation to the Site

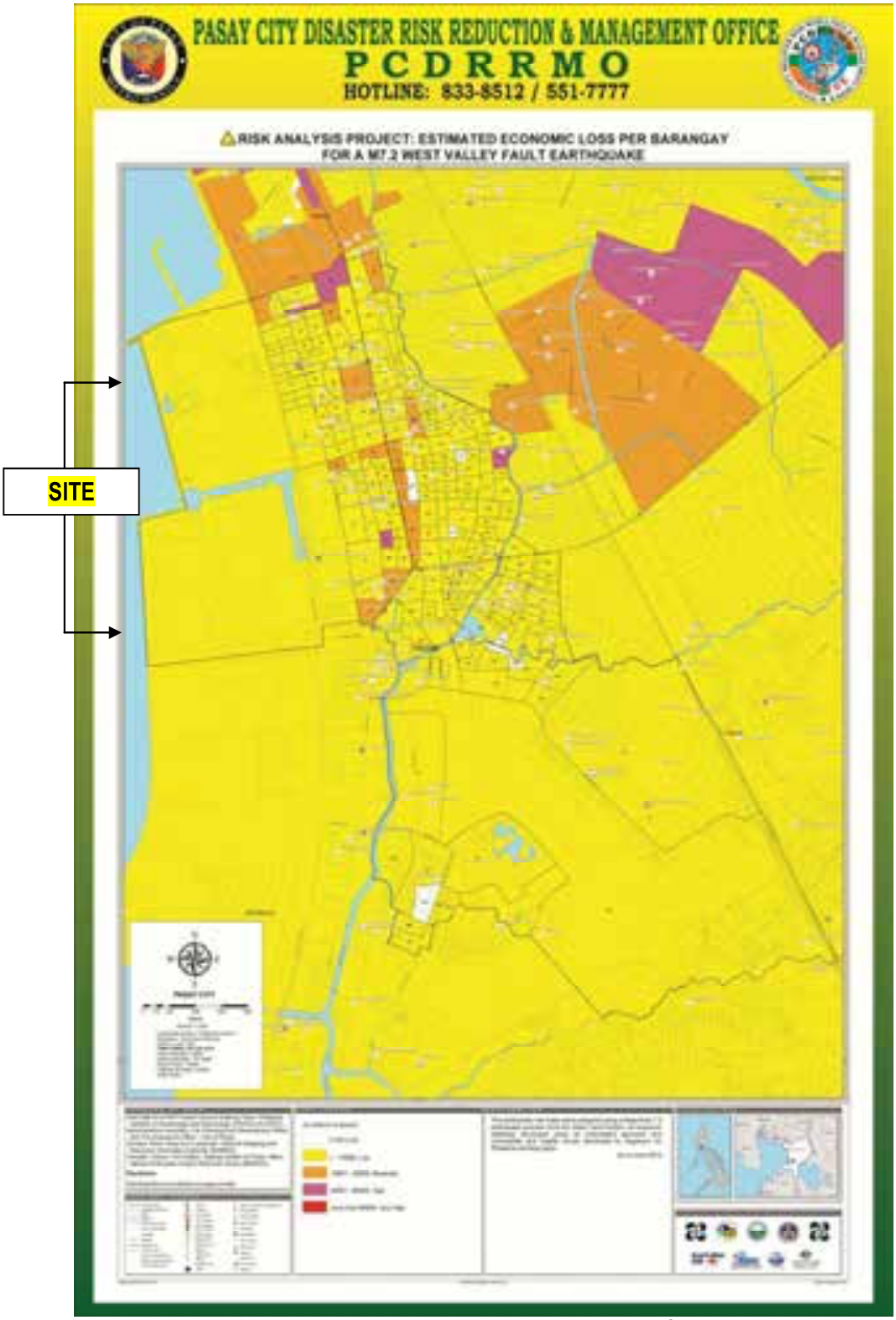


Figure 2.1.16 Estimated Economic Loss per Barangay for M7.2 West Valley Fault Earthquake

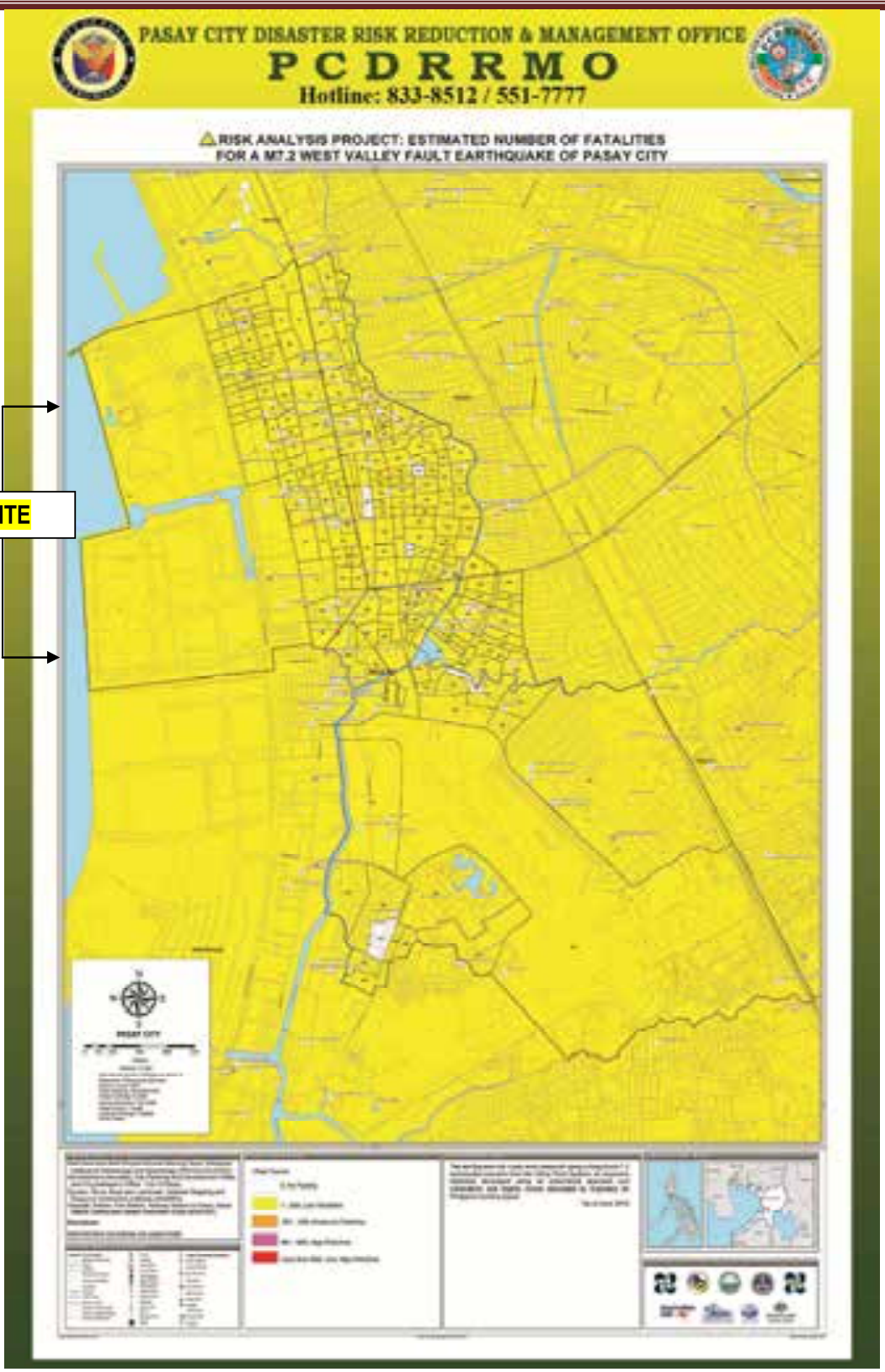


Figure 2.1.17 Estimated Number of Fatalities for M7.2 West Valley Earthquake

2.1.2.3 Stratigraphy

The stratigraphy of Pasay City is shown in **Figure 2.1.18.**

CENOZOIC	QUATERNARY	Holocene		Qal **QUATERNARY ALLUVIUM** Detrital deposits, mostly silt, sand and gravel	Rocks deposited during the
		Pleistocene	Late	Qtt **GUADALUPE FORMATION** The upper member (Diliman Tuff) is thin- to medium-bedded, fine-grained vitric tuffs and welded volcanic breccias with subordinate amount of tuffaceous, fine- to medium-grained sandstone	
			Early		

SOURCE: Geological Map of Manila and Quezon City Quadrangle, MGB, 1984

Figure 2.1.18 Stratigraphy of Pasay City and Vicinities

Pleistocene Age of Quaternary Period underlie Pasay City and vicinities. The most dominant rock formation in the area is the Guadalupe Formation. Guadalupe Formation consists of an upper member, the Diliman Tuff, and a lower member, the Alat Conglomerate. Diliman Tuff, the most widespread rock in the region, consists of thin- to medium-bedded, fine-grained vitric tuffs and welded volcanic breccias with subordinate amount of tuffaceous, fine- to medium-grained sandstone. The tuff varies from well lithified and massive to loosely-bedded. Dips are generally gentle ranging from 3° to 10°.

Conformably overlying the above rock formation is the Quaternary Alluvium consisting of unconsolidated deposits of silt, sand and gravel. Dated Holocene and considered as the younger rock formation, the alluvium deposits are commonly found along stream channels, flood plains and coastal areas. The project site, a reclaimed area consists of sand, gravel, cobbles with clay and silt material and falls under this formation.

Regional/General Geological Map

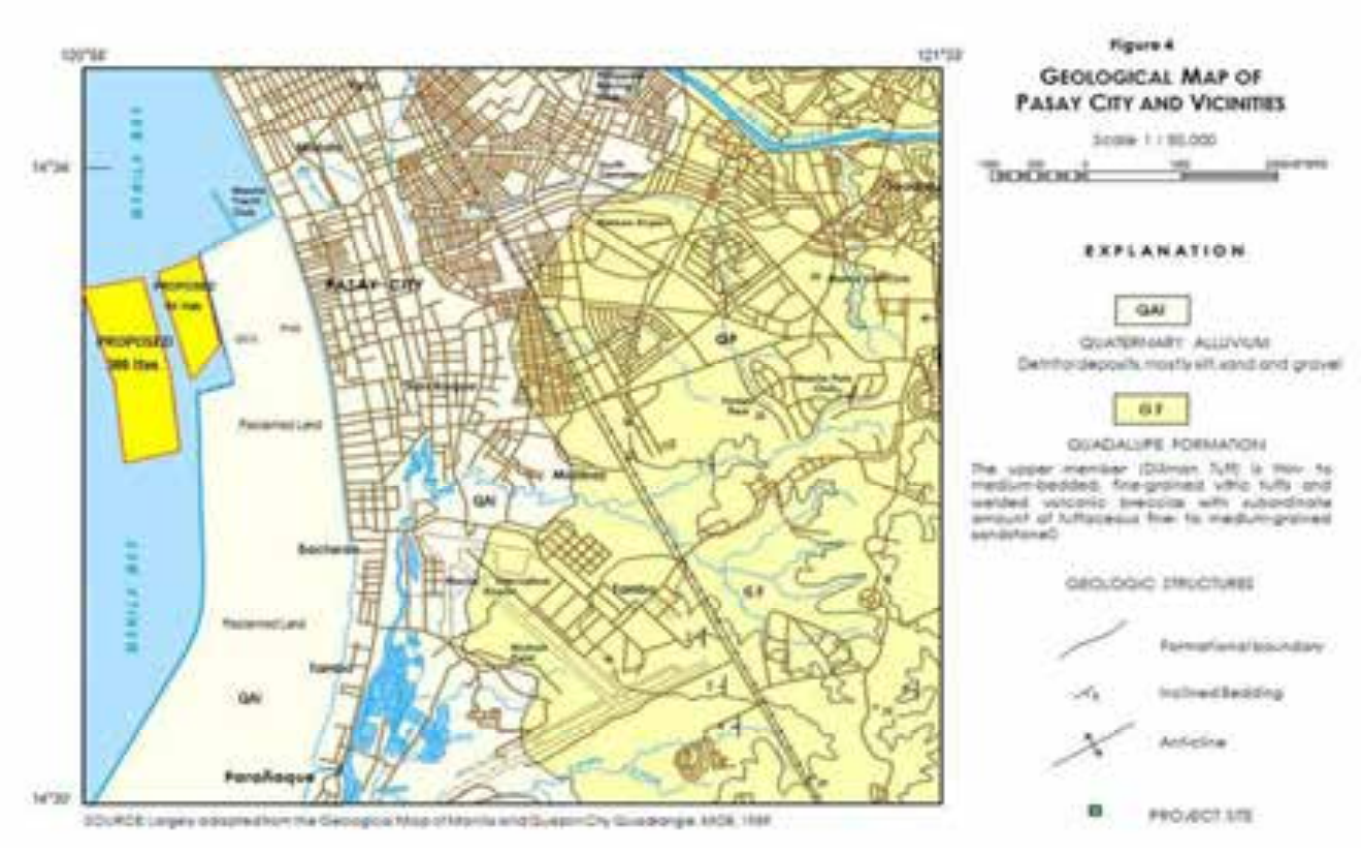


Figure 2.1.19 Geological Map of Pasay City and Vicinities

Structural Geology

The prominent and active fault proximal to the project site is the western extension of the Valley Fault System. The Valley Fault System consists of two northeast trending structures that bound the Marikina Valley: the West Valley Fault (WVF) on the west and on the east, the East Valley Fault (EVF). The EVF was traced for 38 kilometers from San Rafael, Rodriguez (Montalban) in the north to the Pasig City area. However, LANDSAT imagery shows that it extends farther to the northeast. The WVF, on the other hand, stretch out north of Rodriguez in western Rizal province, passes east of Metro Manila and possibly extends as far as Tagaytay Ridge in the south. Its nearest section passes about 8.0-kilometers east of the project site.

Other significant geologic structures in the region include the Lubang Fault, Philippine Fault Zone and the Manila Trench.

Lubang Fault, found between Batangas and Mindoro Island, is an active strike-slip fault that has also been the site of large earthquakes in the past, notably that of 1852 and 1972 (Daligdig and Besana, 1993). The most recent one was the 1994 earthquake in Mindoro, which registered a seismic magnitude of 7. It is located about 75-kilometers south-southwest of the project site.

The Philippine Fault Zone is a left-lateral, strike-slip fault that has been the source of many destructive earthquakes in the past. Movements along the Philippine Fault Zone produced majority of the most devastating earthquakes in Philippine history, including the 16 July 1990 event. A seismic gap along this fault located about 80-kilometers east of the site can produced a future earthquake in the order of at least magnitude 7 is highly possible (upon the released of large stresses stored along the locked portion). Its nearest segment is about 67-kilometers east of the project site.

Soil Stabilization

In any reclamation project, of paramount importance is the creation of good quality land that will serve the purposes for its envisioned development. To achieve such objective, a good source of filling materials or burrow pit areas should be utilized. Unfortunately, this is not always possible due to some geographical factors posing some constraints to that objective. In some instances, even the available equipment and technology may prevent use of good dredge fills such as in too deep burrow pit areas which are beyond the capability of available equipment to reach.

On the assumption that good filling materials are available for use, the quality of the reclaimed land may still suffer infirmities if the original underlying soil in the reclamation site is poor such as what is now obtaining at the project site. It is a common knowledge in all reclamation projects that settlement or ground subsidence will occur not only due to the consolidation of the fill but also of the original underlying soil itself. It is also a fact that the rate and amount of settlement are very dependent upon the type of the original ground stratification.

Further, depending upon the results of the detailed investigation of the available burrow pit areas, relatively poor soils may sometimes have to be utilized on some portioned of the project site due to other consideration outside of the Technical requirements thereby making some parts of the reclaimed land low grade.

Soil Stabilization Alternatives

Considering available of technology and equipment, several methods of soil stabilization have been studied for the project. These methods are described as follows:

1. Embankment or Surcharge Methods

A volume of soil is placed over the reclaimed land to be improved. The weight of the surcharge will force out to escape of the entrapped water within the voids of the saturated underground soft soil thereby inducing settlement at an accelerated rate.

2. Sand Drain Piles Plus Surcharge

This method involves the construction of vertical sand piles at certain spacing down to the bottom of the soft soil layer in question to allow the drainage of pore water when the weight of the surcharge is imposed over the subject area. With the accelerated escape of the water from the voids within the soil, settlement is induced at a very much faster rate that if surcharge is used only without providing vertical drainage pathways. The subject area can therefore be made usable at a very much earlier date.

3. Sand Composer Piles Plus Surcharge

This method functions very much similar to the sand drains except that the composer piles can also serve later as vertical columns that will allow the stabilized land to support bigger loads. In the construction process, the sand composer piles are compacted vertically and laterally. Because of the later compaction that will be induced on the adjacent soft soil, pore water pressures will be increased accordingly. When the surcharge is finally placed over the subject area, the pore water will be forced out to escape through the voids of the sand composer piles thus accelerating the settlement very much faster than the natural consolidation process.

4. Well Point Plus Sand Drain Piles

This is the use of well point equipment to dewater the soil down to the desired depths. The series of riser pipes are installed down to the reach of the pipes around the perimeter of the area to be stabilized. These risers are then connected to the horizontal head piles attached to a powerful pump that will drain out all the water within the soil. Continuous pumping is required to maintain the drawdown of the underground water level. For very impervious soil, the provision of sand drain piles is also necessary to shorten the time of area is no longer necessary since the dried soil serves as the surcharge for the underlying soft soil layers.

5. Dynamic Compaction

This method involves the use of huge weights to be dropped by a crane over the area to be improved. The impact transmitted to the underlying soft soil builds up the pore water pressures within them and thus forces out the escape of the pore water to the surface

6. Vertical Drains Plus Surcharge

This method functions exactly the same as the Sand Drains plus Surcharge Method. The only difference is that with this system, the sand drain piles are replaced with the vertical drains which are manufactured for the purpose in the form of wicks or strips and made of non-degradable materials. The core consists of ducts where water can flow upwards and wrapped around with very porous sheeting through which water can enter the core. The wick comes in various trademarks and designs but more or less uniform in the overall dimensions. For ease in handling and installation, the wick comes in coils.

All the above-described methods were first evaluated on the basis of technical considerations such as applicability to the project area with the type of soil described in previous studies, available equipment required, particularly the type and capacity and the characteristics of the newly reclaimed land as to load carrying capacity prior to stabilization. Cost comparison was not done since Technical evaluation alone of alternatives left but one to be feasible as shown by the following results:

1. **Embankment or Surcharge Method** – Preliminary calculations with about 5-meter high embankment indicated approximately 5 years to attain full consolidation. This is too long a period of time to wait for the utilization and disposal of buildable areas not taking into account yet the length of construction time required for the development of the site in terms of provision of roads, utilities, etc.

2. **Sand Drain Piles Plus Surcharge** – Under this method, the sand drain piles may not be continuous if improperly installed in addition to the fact that they are very much susceptible to shear failure during the planning of the surcharges. Further, the equipment required is usually heavy and require good construction surface which is not available yet on a newly reclaimed land. This was demonstrated by the experience of PNCC during the ground improvement of the Financial Center Area in MCCRRP.

3. **Sand Composer Piles Plus Surcharge** – The system is vulnerable to the same problems as the sand drain piles. In addition, during the process of compacting the piles vertically and laterally, they can easily be clogged with fine within the soil. Should this happen, resistance to flow of pore water can become high thus requiring higher surcharge or embankment.

4. **Well Point System Plus Sand Drain Piles** – In addition to having the same problems as the sand drain piles, the presence of soil-laden water with high salinity is a potential source of problem for maintenance of the equipment.

5. **Dynamic Compaction** – The equipment required are huge and heavy that the newly reclaimed unconsolidated ground may not be able to support. Provision of matting and grillages is costly and very inconvenient every time equipment position transfer is executed. The methods are not very effective as proven by the test conducted by the PNCC for stabilization of the First Neighborhood Unit.

6. **Vertical Drains Plus Surcharge** – Under this method, the vertical drains have high breaking strength and reinforce the soil in tension. Various types of drains are commercially available that a specific type of drain can be chosen to be exactly consistent with the actual permeability of the soil. Equipment required to install the drain is very light and can easily be supported by the newly reclaimed land. The rate of flow within the drain is higher, thus less height of surcharge is required. From the economic viewpoint, the surcharge can be eliminated if good dredge fill materials are available. Upon completion of the reclamation, the dredge fill itself will function as the surcharge.

On the basis of the above discussion, it was finally decided to adopt the Vertical Drains plus Surcharge method for the project.

Soil Stabilization Utilizing Vertical Drains Plus Surcharge

In general the reclaimed fill from the first alternative source of burrow directly west of the proposed reclamation is expected to be of the same quality as the existing upon 4 to 5 meters soft layer. Basically the major roads wherein the main utilities for drainage, water, electricity

and telephone, will be stabilized mainly to protect these utilities from the damaging effects of large differential settlements commonly expected in this kind of development.

Soil stabilization basically consists of wick drains driven from the finished elevation of the reclamation which is about +3.00m, ranging from 11m to 15m at spacing of about 2.0 meters on center. This will be done for all the roads. At the top layer a sand mattress with a minimum thickness of 0.50m will be provided to serve as a way for the drained water underneath to be ejected. On top of this sand layer is the soil surcharge of about 3 meters thick required to consolidate the soft clay layer underneath. The soil stabilization plan as described has been designed to achieve a 90% consolidation in one year. About 70% consolidation will be achieved in 6 months. Based on the implementation schedule requiring about 5 year's development, it seems that the object of 90% consolidation in one year would fit in perfectly in the schedule. Secondly, the remaining 10% settlement which will occur for many years after all utilities are installed will practically have minimal damaging effects.

The soil stabilization Contractor who will undertake the installation of the wick drains as well as surcharging is also expected to provide for continuous monitoring. Instruments such as inclinometers, piezometers, strain gages, settlement plates and surcharge slope indicators have to be installed by them. An extensive soil investigation will also have to be undertaken by them. This will be a combination of some actual soil boring and the rest Dutch cone penetrometer test. Laboratory tests to determine vertical and horizontal consolidation properties of the soil as well as permeability will also have to be undertaken by them for final evaluation by the consultants.

Breakwaters and Bulkheads

The project involves, as one of its major components, the construction of main and secondary bulkheads of varying depths to retain the fill. These marine protection structures are planned to favorably enhance the existing physical environment at the project site, thus, the selection of their structural type becomes a major consideration. Therefore, in the design of these structures, the following factors were taken into account:

1. Foundation conditions which have significant influence on their settlement and stability and therefore on the type of structure.
2. Exposure to waves and related oceanographic conditions which control their geometry.
3. Availability of construction material to be used including costs which are significant determinants on the economic feasibility of the type of the structures chose.

Considering the above factors, two (2) general classifications of bulkheads are required for the reclamation area as dictated by the extent of their exposure to oceanographic conditions. These are the main bulkheads which are directly exposed to wave actions and the secondary bulkheads with less exposure to wave attacks. Foundation conditions have the same bearing on both, and therefore not considered in classifying the structures. The factors associated with soil will, however, be very important considerations in the selection of structure type to adopt for both classes of the bulkheads.

Main Bulkheads

As to type the structure, two (2) alternatives were considered for the bulkheads, namely: the rockmound type and the walled steel pipe piles.

Other structural types of bulkheads in addition to the two (2) chosen alternatives above were also considered such as the cellular and double steel sheet pile wall construction with tie rods

and walling to reduce flexural stresses and increase stability. These were ruled out at the initial stage of the technical evaluation due to:

1. The type of the structure will be very susceptible to damage due to differential settlement considering that the first 4 to 5 meters of the seabed consists of very poor materials with very low shear resistance.

2. The tie rods and deadmen will require substantial open space that may pose problems during the development of the area due to obstructions.

3. Probability of damage during the construction stage is high especially during the southwest monsoon when the structures are not yet filled up with dredge fills.

On the other hand, both of the alternatives considered are very reliable under very severe sea conditions as proven by experience on similar projects abroad, notably in Japan. Unlike sheets piles, walled steel pipe piles can be designed as free cantilevers and therefore can be driven down to firm foundation thus eliminating settlement problems. For the rockmound type, settlement is not foreseen to be critical since the structure can undergo considerable settlement without sustaining damage. In terms of construction, walled pipe pile bulkhead is very much superior to the rockmound type which normally takes considerable time to build. Technically, both alternatives can therefore, be adapted to the project. However, the final choice was made in favor of the rockmound bulkhead after evaluation of their costs. The superiority of the later in terms of shorter construction time can be nullified by the fact that will appropriate procedure and technologies, reclamation can be done even without the area already enclosed by the bulkheads.

Secondary Bulkheads

For the design of the secondary bulkheads, it was decided that the upper portion just above the high waterline be made sloping for aesthetic reasons. This requirement is very advantageous from an engineering standpoint. With the finished grade at Elev. +4.00 meters and the high water at Elev. 1.00 meter, a minimum reduction in the height of 2.00 meters was made possible resulting to substantial reduction in lateral pressure due to the dredge fill. The use of cantilever sheet piling now becomes attractive considering less stringent requirements for embedment. However, upon evaluation of their costs, this alternative appear too costly and therefore, another alternative was considered – the rock revetment type.

The design details of the rock revetment type of bulkhead are based on standard dimension which will be firmed up in the detailed engineering design stage. The minimum weight of rocks specified was based on the dislodging forces of waves within a maximum height of 0.70 meter that is expected to be generated by the NE monsoon winds over the area. In the case of the main bulkheads, the required weight of the individual stones was determined as recommended by Dribarren for shallow water waves.

As in the case of the main bulkhead, stability was also the prime consideration in the design of the secondary bulkhead. A rock revetment type turned out to be the best alternative. Similarly, in order to solve the stability of the rock revetment, it also was apparent to remove the very soft upper soil layer averaging about 6 meters and replacing it with a much better selected dredge fill preferably sandy material with higher shear resistance. The solution will result with the soft soil completely removed and the new selected dredge fill seating on a hard soil layer, thus assuring stability of the revetment.

Source of Fill Materials

Dredge fill materials abound in the PRA offshore burrow area at the San Nicolas Shoal (SNS) which has a deposit of 300 million cubic meters and which replenishes on its own through

time. An alternative source to the SNS is the lahar deposit in Pampanga and Zambales which can be transported to the proposed site by barges via Manila Bay to attain economies of scale. The acceptability of the lahar as filling materials for reclamation shall be studied at the detailed engineering stage of the project.

The SNS is barely an hour travel time to the project site. The Pampanga and Zambales areas may take some 3 hours to haul the lahar materials to the project site.

Requirement for rocks shall be sourced from Rizal and Bataan Provinces and any supply deficit in these areas Albay Province shall be tapped. The use of tetra pods is also being considered as an alternative material for the containment structures.

2.1.2.4 Inducement of subsidence, liquefaction, landslides, mud/debris flow, etc.

Geological maps as needed, hazard maps, (NAMRIA, NDRRMC, MGB, PHIVOLCS, PAG-ASA) Discussions on impacts/effects of natural hazard on the project.

2.1.2.4.1 Subsidence

Land subsidence generally attributed to excessive groundwater extraction has been experienced not only in Metro Manila but also in many neighboring countries shown in **Table 2.1.5.**

Table 2.1.5 Subsidence and corollary effects besides flooding due to groundwater withdrawal (Partial List)

Location	Land Use	Period	Subsidence (centimeters (cm))		Corollary effects
			Cumulative	Rate (cm/year)	
Japan					
Tokyo	Metropolis	1900-76	440	2.7	
Osaka	Metropolis	1934-68	280	8.2	
Shirioshi plain, Kyushu	Agriculture	1960-98	123	3.2	Ground fissures Saltwater intrusion
China					
Hangu City	Metropolis	1980-97	>100	5-9	
Shanghai	Metropolis	921-65	263	6.0	
Vietnam					
Hanoi	Metropolis	1988-93		2-6	Ground fissures
		1998		2	Building damage
Philippines					
Manila	Metropolis		>100	5-9	Ground fissures
Pampanga delta	Aqua and agriculture	1991-2003	>100	3-9	Saltwater intrusion

Source: Global sea-level rise is recognised, but flooding from anthropogenic land subsidence is ignored around northern Manila Bay, Philippines; Dr. Kelvin S. Rodolfo and Dr. Fernando P. Siringan

Ground subsidence at excessive and accelerating rates is cited as allegedly pertinent to this project on the basis of satellite generated measurements during the period from 2003 to 2006. In geotechnology, ground subsidence or settlement reduction in volume or consolidation is conveniently thought of as having primary and secondary components where, with the exception of highly organic soil, the primary component predominates. It is caused by the gradual removal of pore water due to superposed loads or by the reduction of pore pressure itself due typically to excessive groundwater extraction.

The secondary or creep takes place at a much slower pace. But more or less, primary and secondary consolidation plot as straight lines on a logarithmic time scale; i.e., at decreasing (not accelerating or even constant) time rates. In this respect, the results of the satellite

measurements over a short period of time is of limited use except to indicate, expectedly, that on-going ground subsidence is relatively greater in the southern portion near the lake of Greater Metro Manila, but not in areas of Quezon City, Ortigas Center, and Fort Bonifacio. The said areas have numerous high rise buildings had been built by 2003 simply because the foundations of these buildings transmit loads to the relatively incompressible bedrock. More importantly, the observed subsidence pattern shows that ground water extraction to the south of Metro Manila does not cause ground subsidence away from the area, as seen from the satellite data.

In areas of Manila where the thickness of the soft soil may be anywhere from less than ten to thirty or more meters, subsidence is much less because it is mainly due to secondary consolidation. Most importantly, the technology exists from reliably estimating and taking into account ground subsidence in the area proposed to be reclaimed.

During the public hearing the following statements were made:

> *"The land (Metro Manila) is subsiding about 30 times faster, mainly from over-pumping of ground water. The added weight of new buildings in reclaimed areas may also speed up the sinking of the land, as is occurring in Shanghai".*
>
> *The proposed reclamation areas experiencing up to 5 centimeters or about 2 inches per year (Source Dr. Mahar Lagmay)*

This concern or perception has also been cited in the Video Message of Cardinal Tagle and the open letter of the church to President Aquino in 2013.

Further, the reference to the experience in Shanghai which was cited in the said open letter is incomplete and misleading. What is not explained is that the soil of Shanghai is generally soft and that land subsidence is largely attributed to ground water extraction.

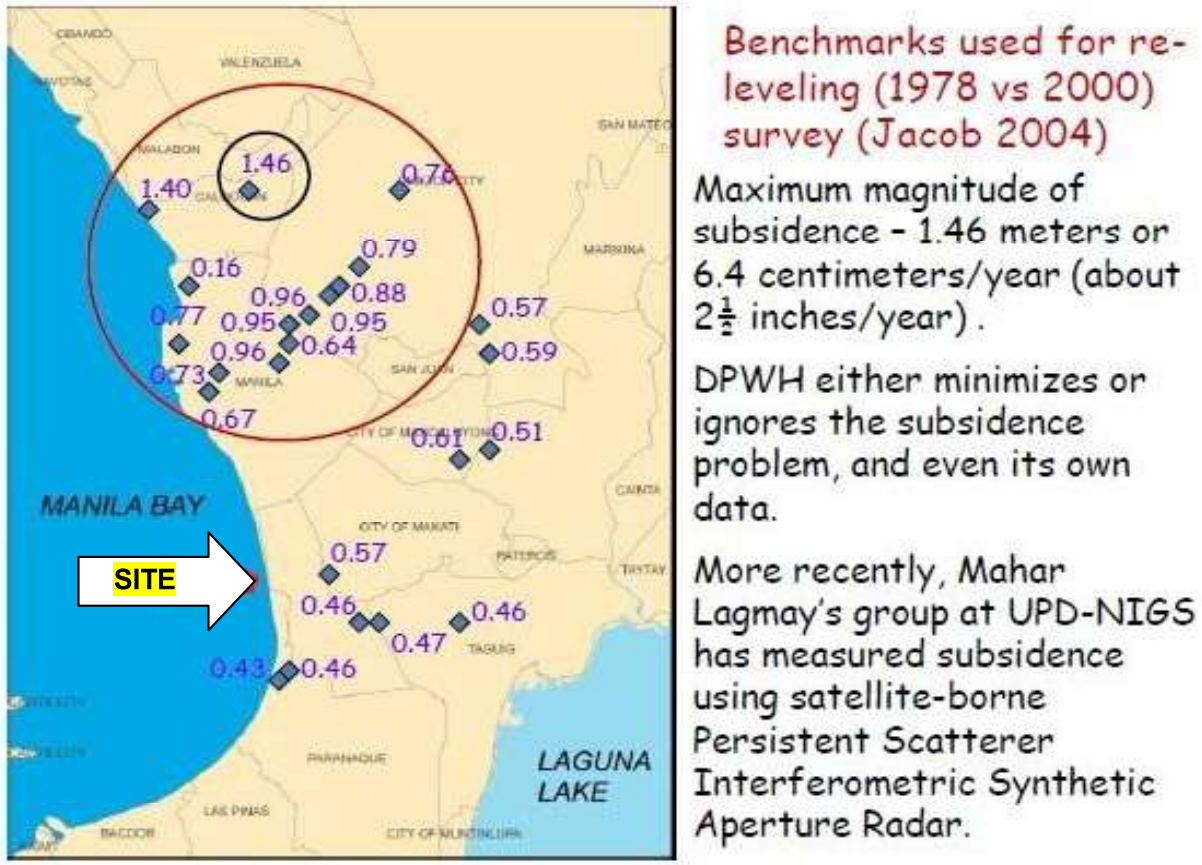
Mitigating measures of the Project

Given that the root cause of subsidence is excessive ground water extraction and cited Shanghai subsidence experience, it is important to note that the project will not undertake ground water extraction. Hence, the project will not cause or contribute to land subsidence. During the reclamation phase, there will be minimal water usage such being accounted for by the needs of the construction workers, the reclamation works being a "dry process".

Thus, with regards to cited Shanghai subsidence experience, the project will not draw ground water and will in fact draw their water requirements from the concessionaires whose sources of water are not from underground resources of Metro Manila. Additionally, Dr. Lagmay's satellite-borne interferometric synthetic-aperture radar based map **Figure 2.1.20** is duly taken into consideration. It, however, shows a big "universe" in Metro Manila and not site specific data pointing to the particular site of the reclamation project.

Further, there could be concern or perception that the reclaimed land may experience subsidence. To address these engineering interventions will be employed as discussed in **Section 3.1.**

The reclaimed land will necessarily have to be stabilized prior to construction of vertical structures during the operations phase. Moreover, as explained during the Public Hearing, the Project Proponent and Developer-Joint Venture Partners cannot allow subsidence to take place even for business reasons alone. The huge investments may be invested if such will occur not to mention the irreparable damage to the reputation of the city and its partners.



Source: Paper of Dr. Mahar Lagmay

Figure 2.1.20 Subsidence in Metro Manila

2.1.2.4.2 Liquefaction

Liquefaction is a process that transforms the behavior of cohesion-less soil from a solid to a liquid (Seeds, 1979). It usually affects loosely-packed and water-saturated sediments.

Liquefaction occurs in water-saturated unconsolidated sediment due to shaking. In areas underlain by such material, the ground shaking causes the grains to lose grain to grain contact, and thus the material tends to flow. This is illustrated in **Figure 2.1.21.**

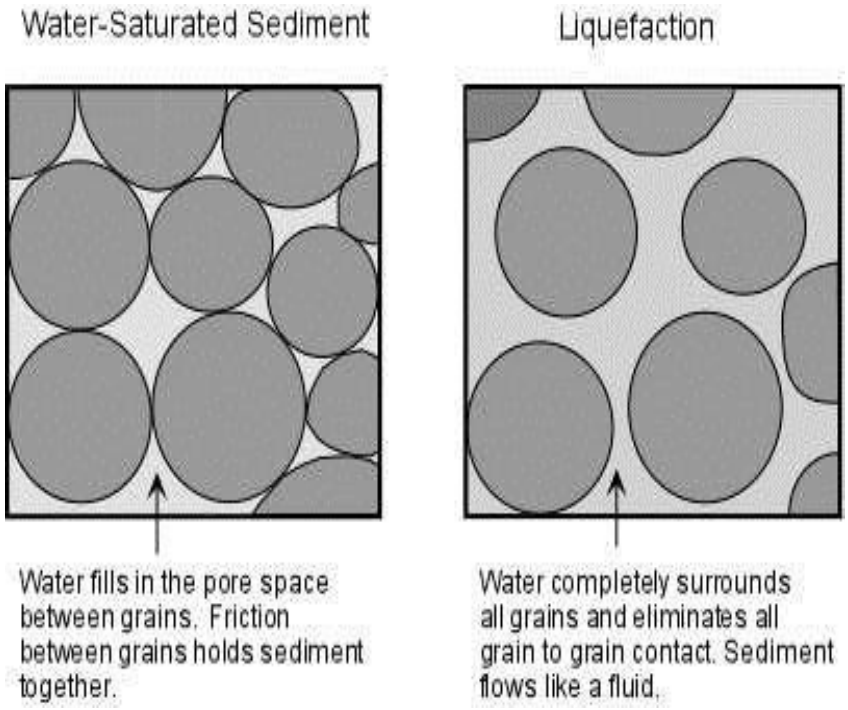


Figure 2.1.21 An Illustration of the Liquefaction Process

Earthquakes, with magnitude as small as 5.5, can induce liquefaction hazard and can affect areas hundreds of kilometers away from its epicenter.

Liquefaction occurs when a water-saturated cohesion less soil loses its strength and liquefies when subjected to intense and prolonged ground shaking. Reyes et al, of UP-Engineering Research and Development Foundation, Inc., in their soil study of areas that liquefy during the 16th July 1990 Luzon earthquake came out with the following soil conditions for the potential liquefiable layers:

(1) loose soil classification;
(2) upper layers of the surveyed areas;
(3) water table near the ground surface;
    a. N-value of less than 30 using the American Association of State Highway and Transportation Officials (AASHTO) method and less than 35 using the Japan Society of Civil Engineers (JSCE) method; and
(4) 50% passing (D50) of approximately 0.001-1.8mm.

Metro Manila is highly susceptible to liquefaction as may be seen in **Figure 2.1.22.**

Mitigation of the risks from liquefaction can be undertaken through engineering interventions:

a. During the reclamation phase whereby based on geotechnical investigation the appropriate methodology will be accordingly adopted. Soil consolidation shall be duly undertaken.

b. During the operations phase, starting from the construction of vertical structures and buildings the appropriate engineering design and construction methodologies shall be adopted.

It is worth noting that the structures constructed in the existing reclaimed land have not shown signs of failures. An equally important observation is that construction works especially of high rise structures continue to be observed in these reclaimed areas, typical construction works are shown in **Plates 2.1.5 and 2.1.6.**

Plates 2.1.5 Photographs of Typical Construction at the Reclamation Area (April 2014)





Plates 2.1.6 Construction Works at the Reclamation Area (August 2016)







Figure 2.1.22 Liquefaction Potential Map of Metro Manila

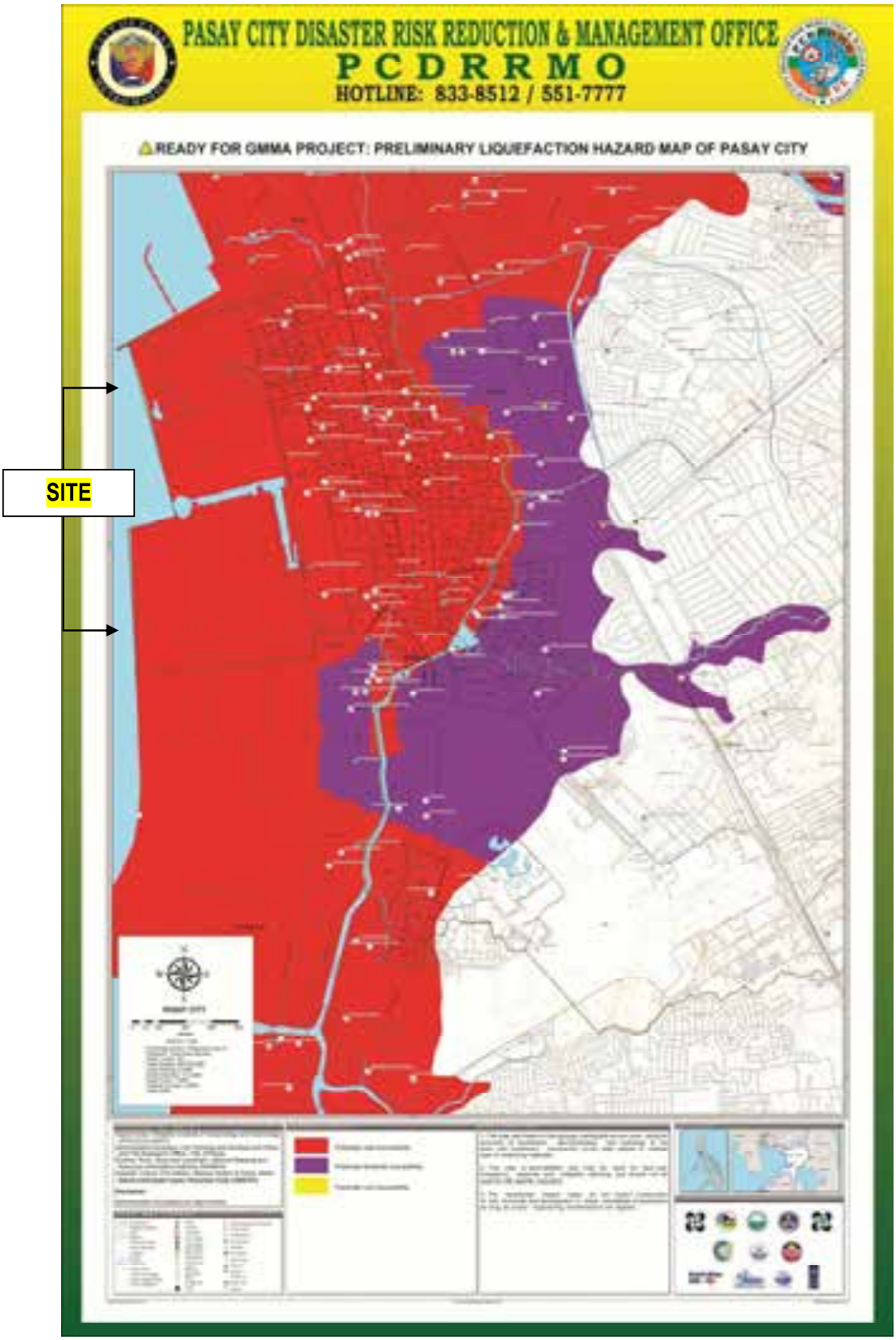


Figure 2.1.23 Liquefaction Map of Pasay City

The Case of the Ruby Tower

The total structural of Ruby Tower collapsed (by "pancaking") during the 1968 earthquake. It was due to lack of sound engineering interventions and not due to ground liquefaction. The science of liquefaction was very young during the said year. It was only studied in depth by Dr. Harry Seed of the University of California, Berkely after the 1961 Alaska earthquake and the Niigata earthquake at about same period. Even though the subsoils beneath the mat foundation indeed had the potential to liquefy, there was no indication that the foundation of the structure had sunk. Neither were there ground manifestations that liquefaction had taken place like sands boils, water fountaining, etc. unfortunately, no instrumental records of actual ground motion amplitudes are available but it seems reasonable to suppose that presence of the week subsoils amplified ground vibrations during the event. In addition, the Integrated Bar Association building in Intramuros suffered a similar type of failure. But again, tell-tale signs of ground liquefaction were not found. Subsequent detailed analysis showed that both buildings violated some code requirements for seismic resistance and also had serious designs and construction defects.

While the potentials/concerns for seismic-related hazards are acutely recognized, engineering interventions provide the mitigating measures.

Ret. U.P. Professor & Consultant Salvador Reyes (Geotechnical Engineer PhD University of Illinois BS CE Univ of the Philippines) provided the following statement which was read during the Public Hearing.

- **The technical viability of foreshore reclamation is hardly a controversial issue because the critical aspects in the present state of the art can be adequately and reliably addressed. Moreover, reclamation is not new.**
- **In Tokyo Bay where the subsoil is similar to that of Manila Bay and seismicity is even greater, reclamation has been ongoing since the Meiji period. Japan of course is also visited by strong typhoons. To date, it has been reported that the reclaimed areas in Tokyo Bay total more than 25,000 hectares.**

On the other hand, in a private meeting at his office and public pronouncements, Dr. Renato U. Solidum, Jr. Director, Philippine Institute of Volcanology and Seismology stated the relevance of engineering interventions.

Additionally, it will be noted from "Simulation of Major Earthquake in Metro Manila (Reference: Earthquake Impact Reduction Study for Metropolitan Manila, Republic of the Philippines. By JICA, MMDA, PHIVOLCS 2004" that the high risk areas do not include the project reclamation areas and are instead identified as

> "The buildings, malls, barangays, subdivisions and villages in NCR identified as potentially most seriously affected by a major WVF earthquake are: Spring Country Subdivision, Filinvest 2, Filinvest 1,Batasan Hills, Alabang Heights, Barangay Tumana, Barangay Pansol, La Vista, Loyola Grand Villas, Loyola Heights, Miriam College, Ateneo, Barangay Barangka, Barangay Industrial Valley Complex, Blueridge A, Eastwood Mall, White Plains, Green Meadows, St. Ignatius, Acropolis, Medical City, Valle Verde Villages, Tiendesitas, University of Life Pasig, St. Paul Pasig, Barangay Kapitolyo, Department of Education, URC Plant, Barangay Oranbo, Barangay Bagong Ilog, East Rembo, Bgy. Comembo, International School, Market Market Mall, Serrendra, Brgy. Pembo,Brgy. Rizal, Mckinley Heights, Cypress Towers, North Signal Village, Tribeca Private Residences, Buli, Asya Enclaves, Alabang Hills, Muntinlupa City Proper, Tunasan, Susana Heights, Southwoods, De La Salle Canlubang and Stone Crest."

The roads and transportation systems that may be affected include the following: JP Rizal in Quezon City, Batasan San Mateo Road, Quezon City, Ortigas Avenue, Pasig City, C-5, Estanislao St. Muntinlupa City, San Guillermo St. Muntinlupa City, Susana Avenue, Laguna, Dona Julia Vargas, Pasig City, etc.

Also the project site is distant from the West Valley Fault system. The photographs of the on-going construction at the Reclaimed area adjacent to the project site were presented during the Public Hearing as one testimony that in fact construction works have been allowed. Moreover, a key testimonial to the soundness of the structures in the Reclaimed Area is the attendance of the world leaders during the 2015 APEC summit held at the reclaimed area, photograph shown in **Plate 2.1.7.**

Plate 2.1.7 Photograph of the World Leaders at the APEC meeting in a Reclaimed Land near the Project Site



2.1.2.4.3 Landslides, Mud/Debris Flows

By the nature of the project these hazards are not considered to be highly relevant.

2.1.2.4.4 Tsunami

A **tsunami** is a series of waves in a water body such as in oceans caused by the displacement of a large volume of water flow. The most common generators of tsunami are earthquakes and also other disturbances above or below water. Unlike normal ocean waves which are generated by wind ortides caused by the gravitational pull of the moon and sun, a tsunami is generated by the displacement of water. Tsunami is generally consisting of a series of waves with periods ranging from minutes to hours.

The paper of Dr. Renato U. Solidum, Jr. **"Earthquake Hazards and Risk Scenario form Metro Manila and Vicinity: The Need for Whole of Society Preparedness May 20, 2015"** gives the scenarios below on worst events of tsunamis in Manila Bay.

A Map of the Tsunami Hazard is shown in **Figure 2.1.24 and Figure 2.1.25** while a "Tsunami Scenario M 8.3 Earthquake from Manila Trench" is given in **Figure 2.1.26** and a Map of a Modeling is provided in **Figure 2.1.27**.

From these references are deduced the following:

- The potential of tsunamis in Manila Bay and at/near the project site may occur such as in scenarios of strong earthquakes.
- Tsunami heights of 3.5 m above mean sea level may be expected.
- An arrival time of more than 1 hour would provide time for emergency and contingency measures.
- It may also be noted that the coasts of Manila Bay are not directly exposed to the Sea (The South China Sea) and are well protected with the narrow entry passage at the mouth of the bay and the Corregidor Island serving as a buffer. Hence tsunamis traveling through the Sea would tend to be dissipated.

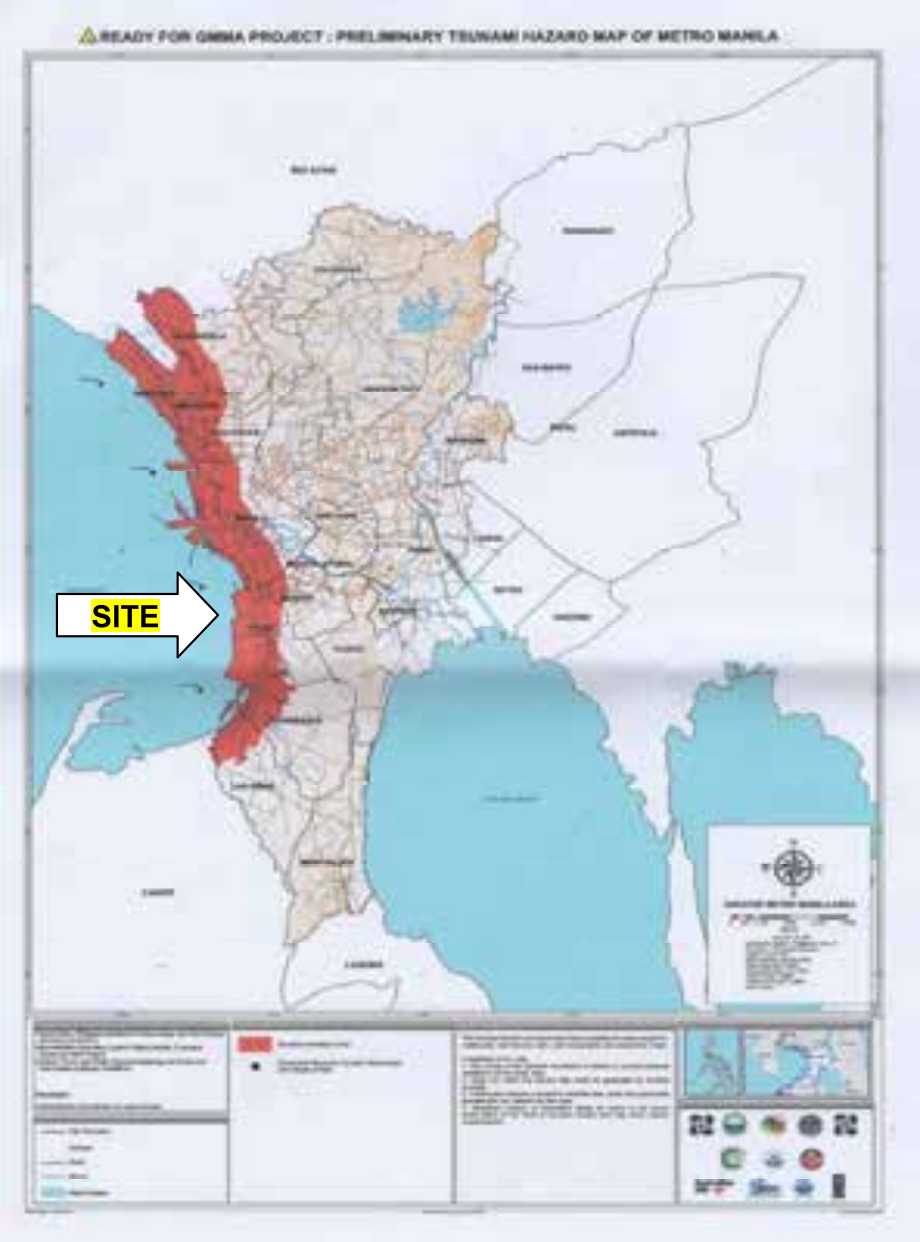


Figure 2.1.24 Tsunami Map of Manila Bay *(Source: PHIVOLCS)*

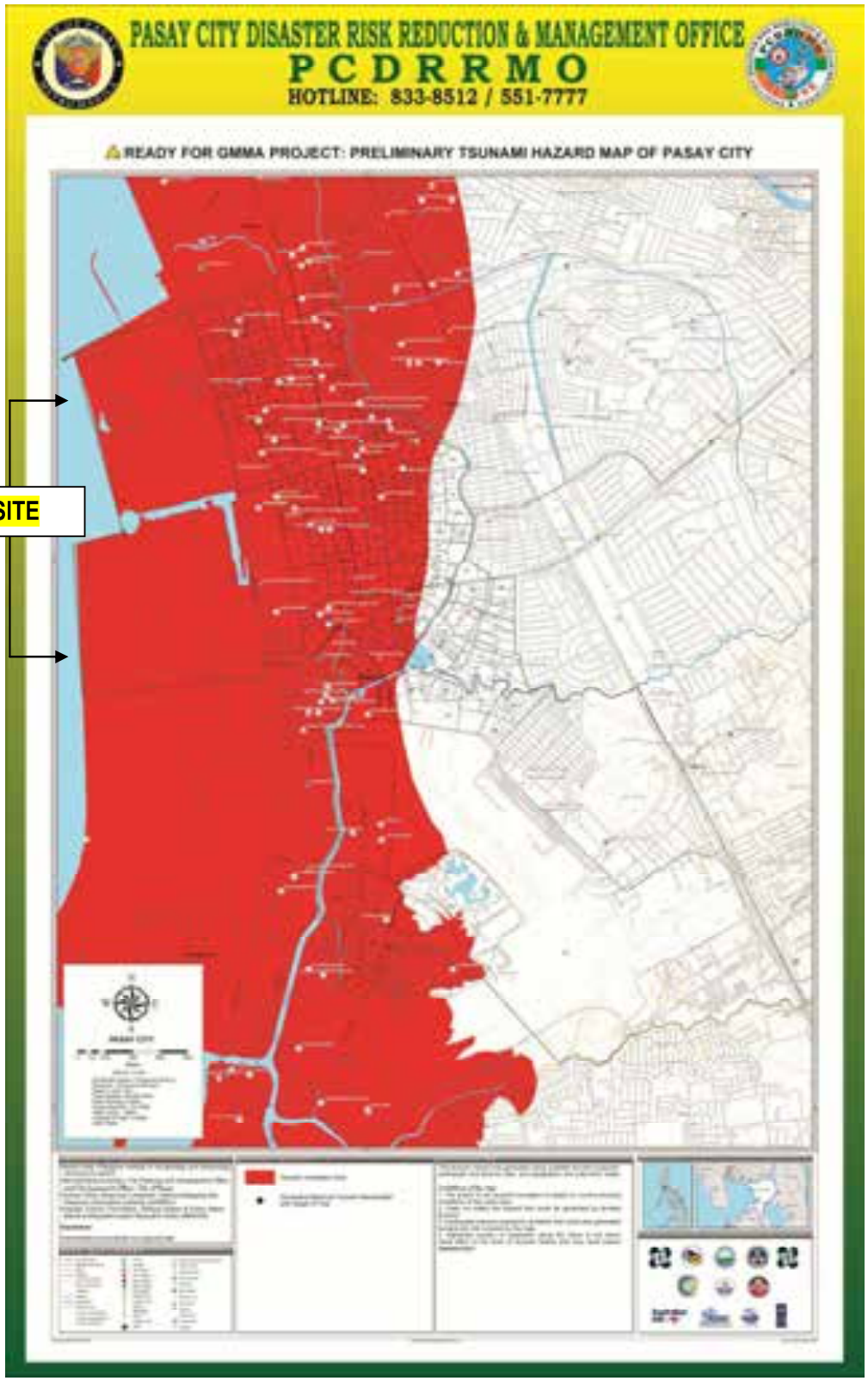
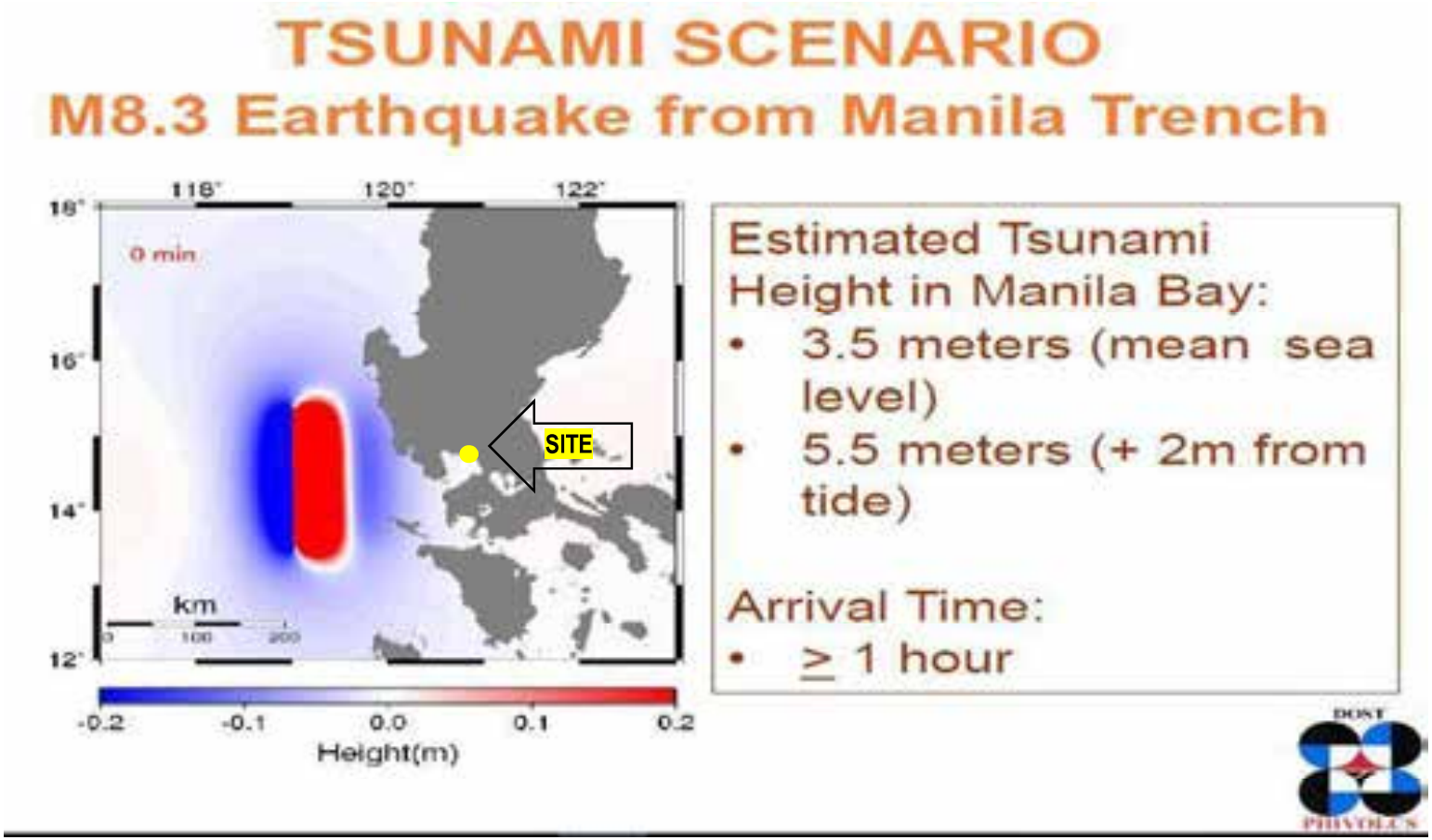


Figure 2.1.25 Tsunami Hazard Map of Pasay City (Source: Pasay City PCDRRMO)



Source: PHIVOLCS

Figure 2.1.26 Tsunami Scenario Based on M8.3 Earthquake



Source: United Nations Office for Disaster Risk Reduction - Regional Office for Europe (UNISDR EUR)

Figure 2.1.27 Tsunami Modeling for Manila Bay May 2009

2.1.2.4.5 Storm Surge

- **Storm Surges**

  Background *(Reference: Technotrix Consultancy Services Inc.)*

  Super typhoon Yolanda reportedly the strongest typhoon in the world to hit land wrought havoc on Tacloban City on November 8, 2013. The said typhoon caused the arising of storm surges causing flood waters reaching to up to ten (10) feet. This disaster event has caused unfounded fears that similar disasters may strike the coast of Manila Bay. On the other hand, it has raised awareness on impacts of storm surges/waves on coastal areas.

  If the proposed reclamation will in fact exacerbate a potential scenario of a strong typhoon and a making landfall in the coast of Manila Bay especially in the project site or immediate environ, following are the science-based facts that are deemed relevant in understanding:

  - Storm surges, storm waves and similar phenomenon are site and precursor-specific (e.g. typhoon). The recent Tacloban "storm surges" brought about by Super typhoon Yolanda have been irrelevantly used creating unnecessary fear on Manila Bay and the project.

  - Waves/surges can occur with or without the reclamation project.

  - There is no direct comparison between Tacloban and Manila Bay because:

    - The Tacloban Bay water has larger surface area than Manila Bay;
    - It has wider opening (55 km) thus allowing bigger volumes of water to enter the coastal areas.
    - It is shallower than Manila bay (depth of almost -2 to -4 m), and hence much higher surge.
    - The funnel shape concentrates surge at Tacloban
    - Typhoon intensity changes as the event passes over the higher topographic elevations of Luzon.

  The comparison is illustrated graphically in **Figure 2.1.28.**

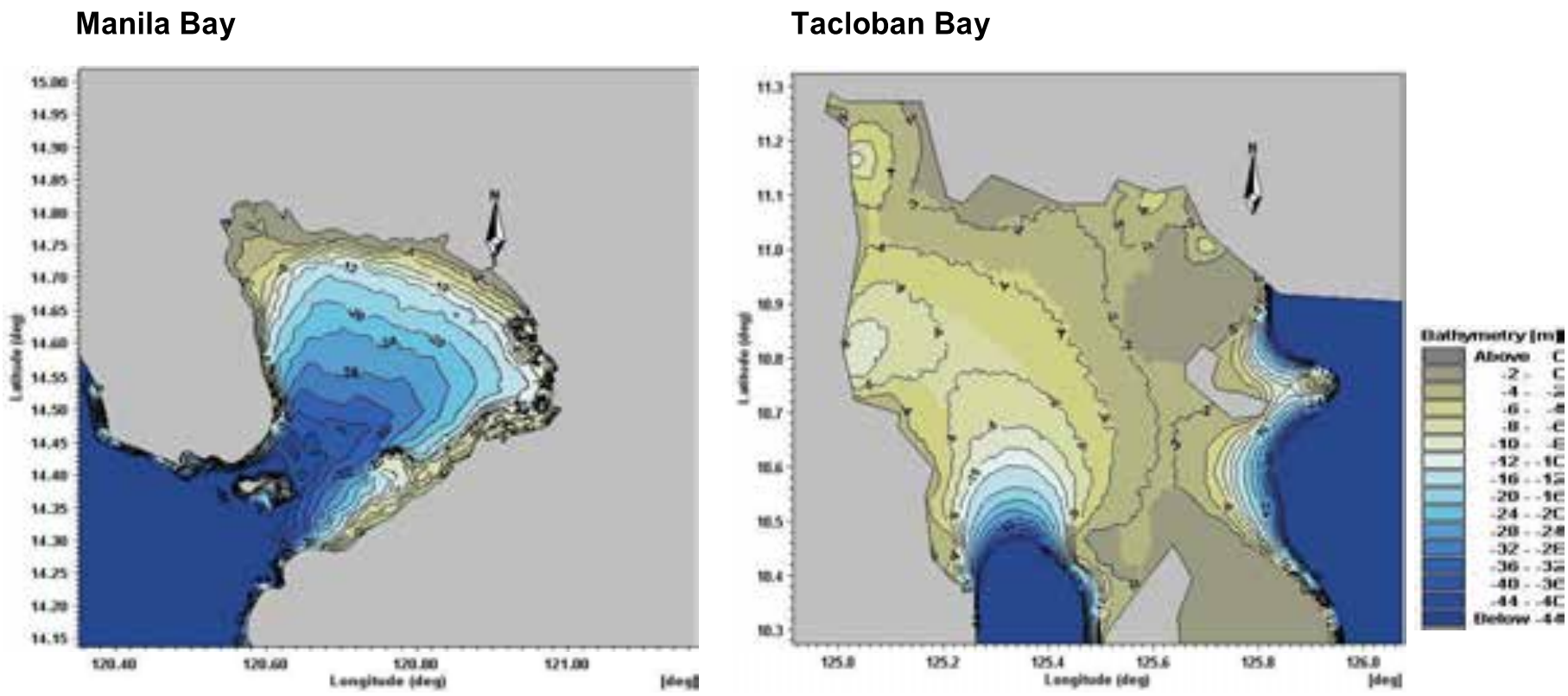


Figure 2.1.28 Comparative Illustration of Tacloban Bay and Manila Bay Occurrence of and dissipation of storm waves

The occurrence of strong typhoons which may result in strong storm waves can take place in the coast of Manila Bay with or without the reclamation project.

Through appropriate engineering intervention, the project can in fact provide sheltering effect to the on shore areas through (a) the elevation of the finished reclaimed land higher than the MLWW and (b) proper use of structures such as wave deflectors.

Storm Surge

Appropriate platform level will be designed to prevent flooding. The said platform will be based on statistical analysis of hind cast wave/hydrodynamic numerical models.

Storm Waves

Storm wave characteristics and design reclamation frontage will be taken into account. Reclamation will shelter adjacent foreshore depending on incoming wave direction.

How the waves may possibly be amplified will be a function of the design of the way in which the reclamation revetment/frontage will be designed. The design can be made so as to mitigate against wave reflections/amplification at any berthing facilities included in the design or adjacent to the land reclamation using physical and/or numerical models.

The elevation of the reclaimed land and the use of correctly designed structures such as wave deflectors will provide further effective method of dissipating storm waves, such protection not available in a *"No Project Scenario".*

A key precautionary measure:

Evaluation of the +4.0 m platform elevation at MLLW vis-à-vis storm surge

Mean Lower Low Water (MLLW) for the site is -0.35m with respect to Mean Sea Level (MSL). Therefore, based on the vertical datum referenced in the above, the "+4m" platform level equates to +3.65m MSL.

In the case of Typhoon Pedring that flooded Roxas Blvd during the morning last 27th August 2011, following are the concurrent components:

- High tide of +0.7m at 0800 hours. It is noted that this tidal elevation is in the 97th percentile of high tides (i.e., a very high tide);
- The surge calculated in the numerical models was approximately 0.2m, an event which occurs about once per year;
- Wave heights immediately offshore were approximately 2m, but the spray resulting from these waves shitting the seawall/revetment were much higher;
- Very high onshore wind speeds were experienced. The spray from the breaking waves was forced onto Roxas Blvd by these winds.

Below are photographs **Plate 2.1.8 and Plate 2.1.9** taken during the event to help illustrate this point.

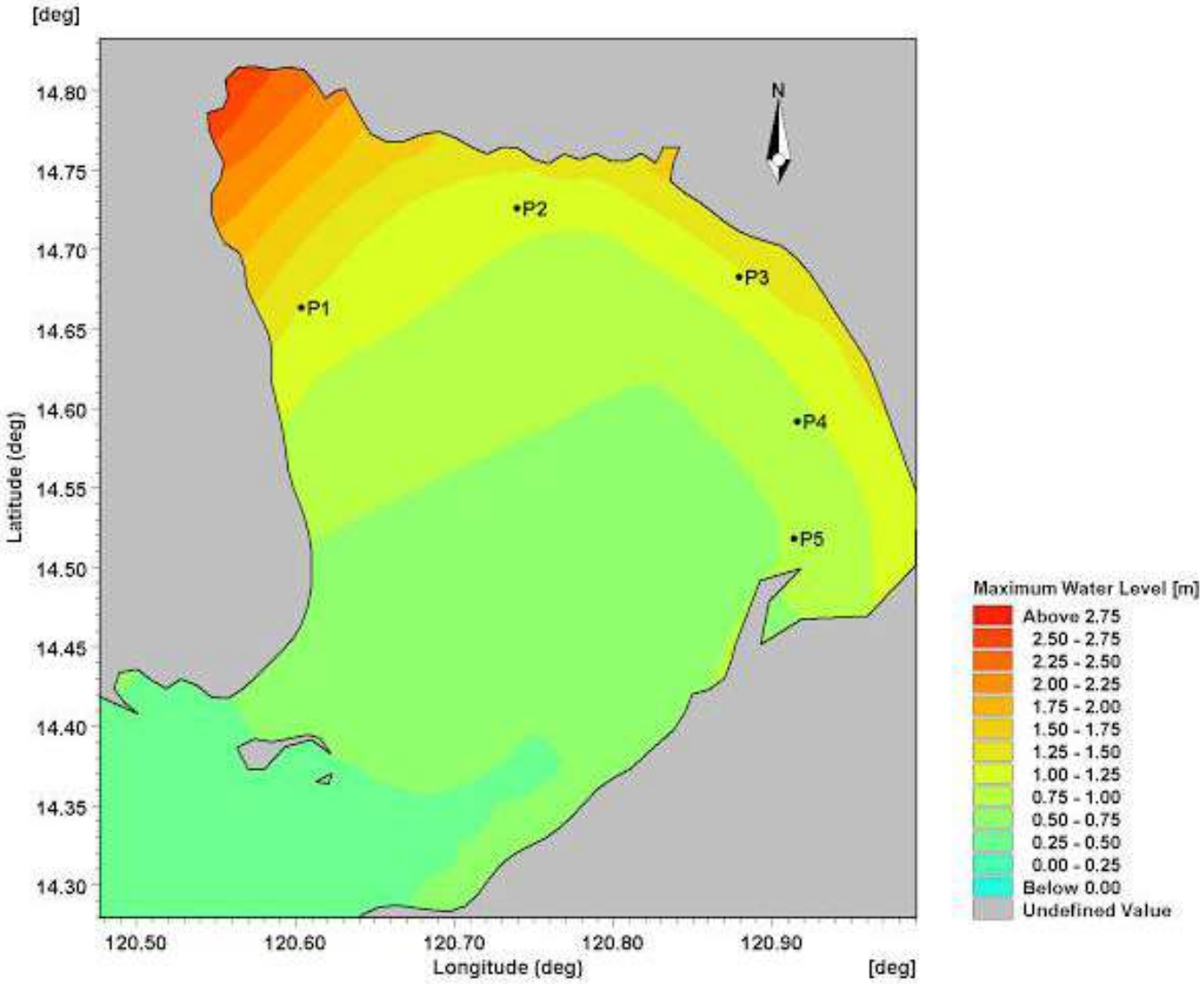
Plate 2.1.8 Photograph of Storm Waves during Typhoon Pedring



Plate 2.1.9 Photograph of Storm Waves Slamming to the Seawall during Typhoon Pedring



Figure 2.1.29 shows the maximum surge water levels in Manila Bay. This map is produced by taking maximum surge water levels. All the typhoons from which simulation and calculation were made of the total maximum surge water levels over the entire bay area. Surges in Manila Bay have been recorded up to 3m, however, based on the attached analysis, these surges appear to have been generated in the northwest, where water depths are shallower and the physical setting produces funnel-like topography which amplified surges.



Source: Technotrix Consultancy Services, Inc. EIS

Figure 2.1.29. A Modeling Undertaken by an International Consultant for the Typhoon Pedring Occurrence

Storm surge scenarios were studied in relation to flooding, from which storm surge heights of 0.91-1.00 meters values were used, alongside with predicted increased rate of rainfall of 14.4 % and a global sea level rise of 29 cm. The IPCC Special Report on Emission Scenarios (SRES) scenarios B1 and A1FI provide a basis for discussing changes in local temperature and precipitation in Metro Manila, based on which hydrological conditions, such as sea-level rise, storm surge and land subsidence, are projected.
(SOURCE: Impacts of Climate Change upon Asian Coastal Area; The Case of Metro Manila Megumi Muto);

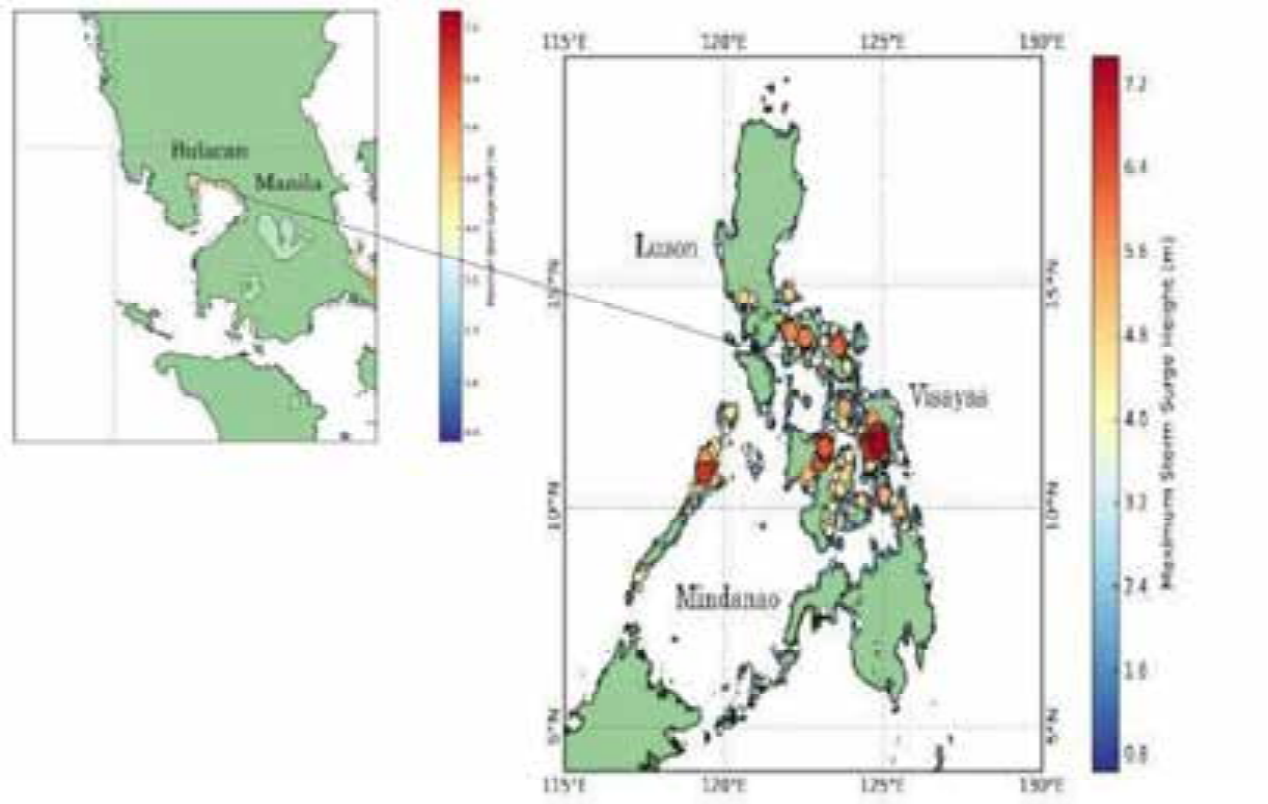
The matrix in **Table 2.1.6** is a summary of climatic–hydrological conditions for the SQ (Status Quo), B1 (Global rapid changes in economic structures toward service and information economy) and A1F1 (Global fossil-intensive) scenarios. Return periods of 10, 30 and 100 years are considered. These conditions provide a basis for flood impact analysis.

Table 2.1.6 Simulation of climatic-hydrological scenarios based on Climate Change

Simulation Case	Temperature Rise ^{0}C, Downscaled	Sea Level Rise (cm) (global)	Increase Rate of Rainfall 24-hr event (%)	Storm Surge Height (m) Manila Bay
1. Status quo climate	0.00	0.00	0.00	0.91
2. B1, no change in storm surge	1.17	19	9.4	0.91
3. B1, strengthened storm surge	1.17	19	9.4	1.00
4. A1F1, no change in storm surge	1.80	29	14.4	0.91
5. A1F1, strengthened storm surge	1.80	29	14.4	1.00

Source: Muto, 2010; Impacts of Climate Change upon Asian Coastal Area; The Case of Metro Manila Megumi Muto

Map from PAG ASA The Storm Surges in Manila Bay. This is shown in **Figure 2.1.30.**



Source: http://blog.noah.dost.gov.ph/wp-content/uploads/2013/10/vol3_no1.pdf. Retrieved on January 11, 2016

Figure 2.1.30 Map of the Storm Surge in Manila Bay

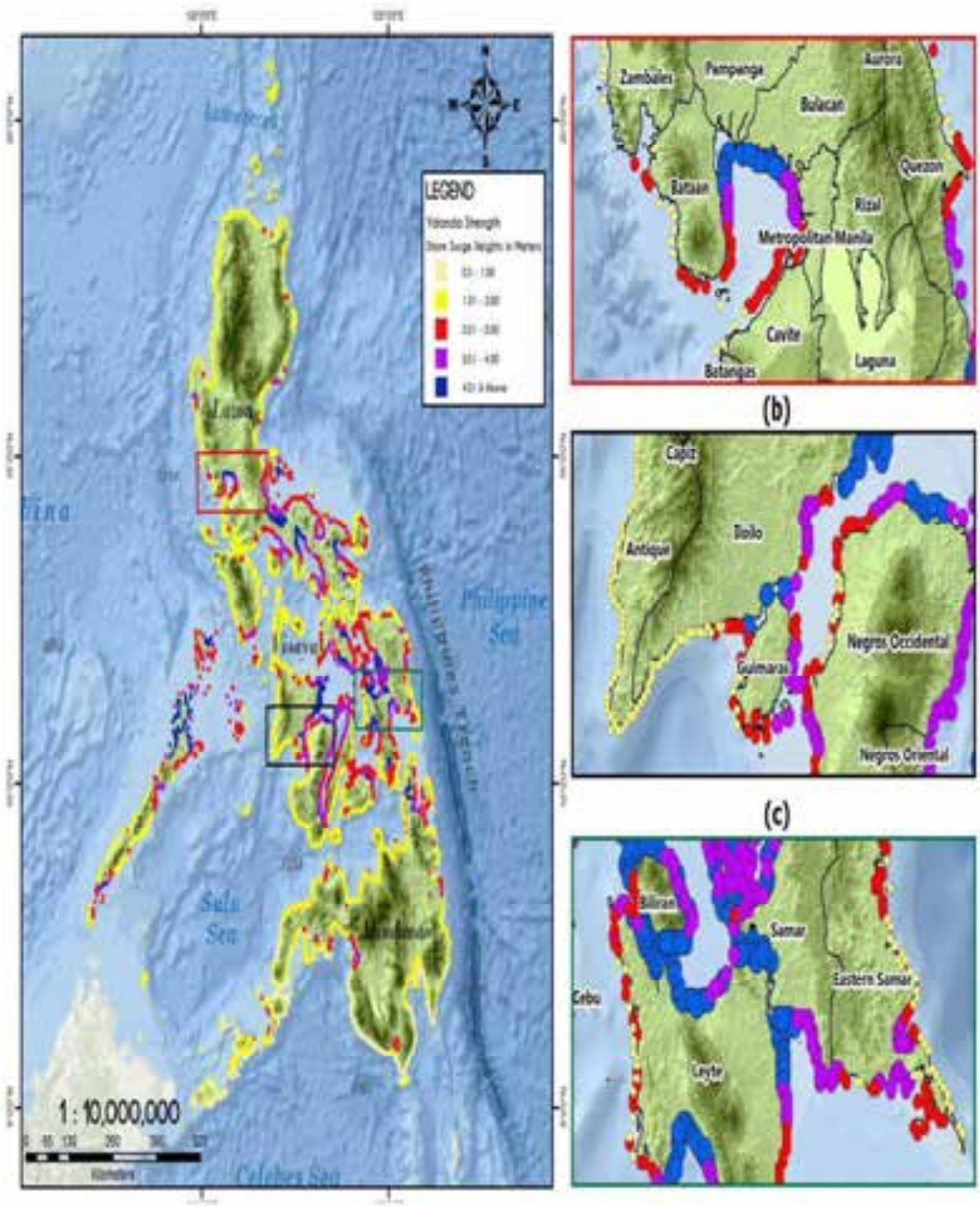


Figure 2.1.31 Map of the Storm Surge (Yolanda Strength)

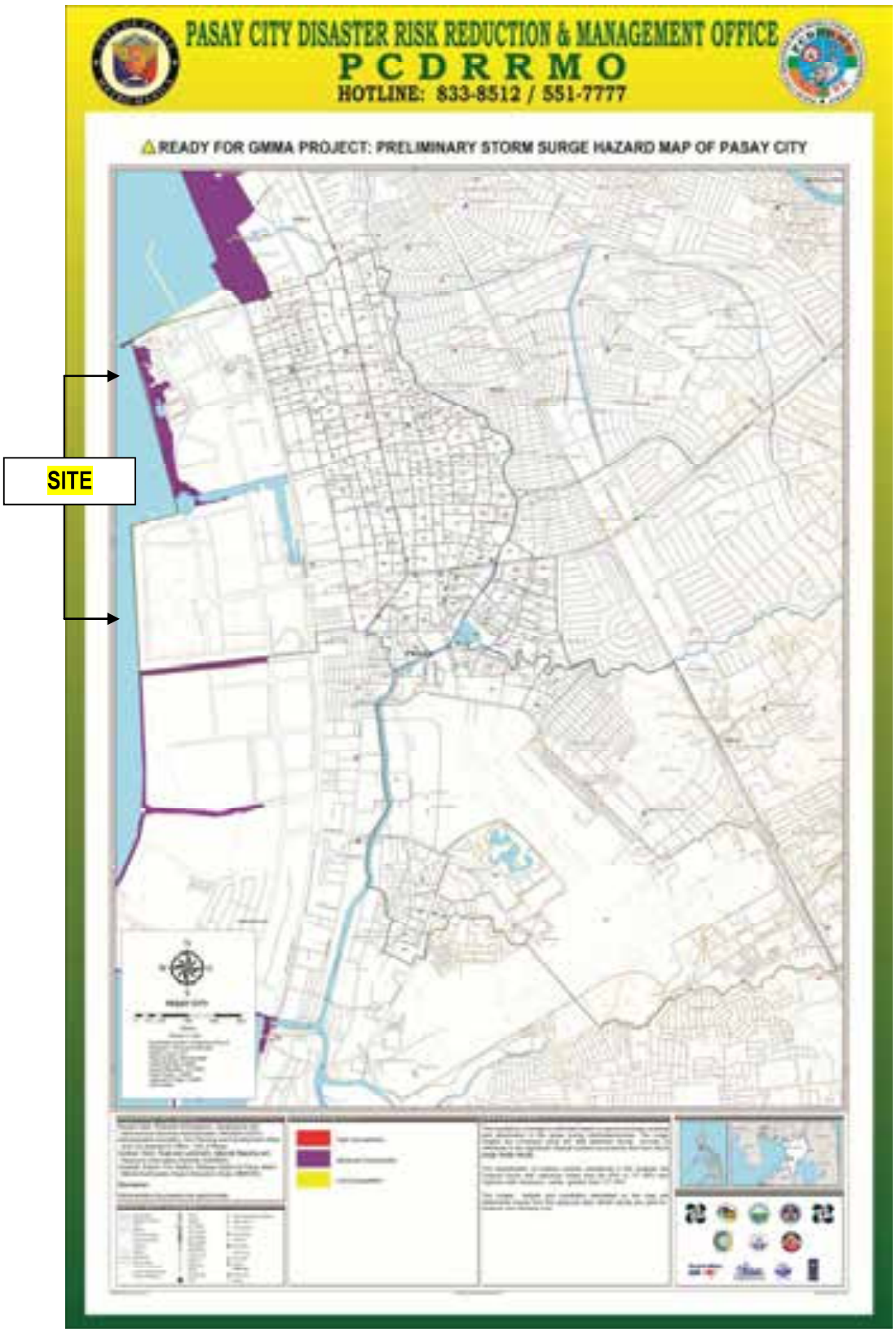


Figure 2.1.32 Map of the Pasay City Storm Surge Scenario (Source: PCDRRMO)

Of the presented storm surge maps, **Figure 2.1.32** is used as reference because it is specific to the site and is based on multisectoral agencies, e.g. the DOST; the said map suggests a "moderate susceptibility" scenario.

Tsunami and Storm Surge and the Reclamation Project - Possible impacts to the project and the planned mitigation.

- ✓ With or without the reclamation project tsunamis and storm surges may occur.
- ✓ The more important impacts are on the shore land and population on shore.
- ✓ The significant impacts are not necessarily on the reclamation project which is the conversion of water body into land mas but on the operation of the various locators, establishments, offices and other facilities during the operations phase of the project, i.e. post reclamation. The elevated reclamation platform provides protection against tsunami and storm surge.
- ✓ The reclamation project has the potential of sheltering on shore population and structures/properties from storm surge or storm wave and from tsunami.

Post ECC Design and Engineering Details

Storm Surge

- Appropriate platform level based to prevent flooding on statistical analysis of hind cast wave/hydrodynamic numerical models.

Storm Waves

- Storm wave characteristics and design reclamation frontage.
- Reclamation will shelter adjacent foreshore depending on incoming wave direction.
- How the waves may possibly be amplified, will be a function of the design of the way in which the reclamation revetment/frontage will be designed. The design can be made so as to mitigate against wave reflections/amplification at any berthing facilities included in the design or adjacent to the land reclamation using physical and/or numerical models.
- The elevation of the reclaimed land and the use of correctly designed structures such as wave deflectors will provide further effective method of dissipating storm waves, such protection not available in a *"No Project Scenario"*. **Figure 1.16 of Section 1 page 1-16** is an illustration of a wave deflector.

Impacts on the Project and Separately on the Land and Population on Shore

Mitigation of impacts on the Project consists of the elevation of the finished platform and the design of the buildings, structures, facilities, etc. for the Operations Phase of the Project.

In so far as mitigation of impacts on the land and population on shore the reclamation project itself provides mitigation measures as discussed above.

Effort versus Storm Surges in Manila Bay

Sandbags were placed at the seawall along certain portion of Manila Bay during Typhoon Glenda in 2014. While the *"Bayanihan"* spirit in this effort was commendable, it may be stated that the measures were not effective as against structures such as reclamation and attendant features such as the platform elevation, use of wave deflectors, etc.

The published comment of previous MMDA Chairman Atty.Tolentino on the sandbags follows:

> FRANCIS TOLENTINO, MMDA CHAIRMAN: *The purpose of these bags is to increase the height of the dike, the water breaker as well as to increase the length. (00:51) In case of a possible projected 2-meter storm surge I think this would also help. Ito ang historically na tinatamaan kasi ito yung gitna eh. (This is historically what gets hit because this is the center.)*

Plate 2.1.10 Photograph of Sandbags Used for Deflection of Storm Surges during Typhoon Glenda last July 17, 2014



Source: *http://www.rappler.com/video/reports/63517-prepared-manila-survives-glenda. Retrieved on January 11, 2016*

2.1.3 Pedology

2.1.3.1 Soil erosion / Loss of topsoil/overburden. *Summary of Soil Investigation Report on soil type and quality; Erodibility potential; Bank stability potential (for reclaimed area). Capability of the land to accommodate the proposed use/development*

The soil investigation report of relevance to this project refers to the geotechnical studies, inasmuch as the key aspect involved is the integrity of the reclaimed land in respect of potential risks principally liquefaction and subsidence of the reclaimed land.

The geotechnical studies undertaken for the Four E-com Building at the Mall of Asia adjacent to the reclamation site may be initially used pending the completion of the formal geotechnical investigation for the project. This survey gave the following results.

Table 2.1 7 subsurface conditions at BH-1

Depth (m)	Soil/rock	SPT N-values	Relative density/consistency
0.0 to 3.0	Sands (SM) and Silts (ML)	8 [25]	Loose
3.0 to 13.5	Silts (MH)	2 to 14	Soft to Medium stiff
13.5 to 18.0	Silts (ML)	[8[26 to 30	Very stiff to hard
18.0 to 19.5	Silts (ML)	'refusal'	Hard
19.5 to 40.0	Sandstone	coring	Highly fractured

Table 2.1.8 subsurface conditions at BH-2

Depth (m)	Soil/rock	SPT N-values	Relative density/consistency
0.0 to 15.0	Sands (SP – SM/SM) and Silts (ML/MH)	0 to 10 [20]	Very loose to Loose/ Very soft to Soft
15.0 to 16.5	Silts (ML)	'refusal'	Hard
16.5 to 40.0	Siltstone	Coring	Highly fractured

Table 2.1.9 subsurface conditions at BH-3

Depth (m)	Soil/rock	SPT N-values	Relative density/consistency
0.0 to 15.0	Sands (SP – SM/SM) and Silts (ML/MH)	0 to 10 [20]	Very loose to Loose/ Very soft to Soft
15.0 to 16.5	Silts (ML)	'refusal'	Very dense
16.5 to 40.0	Siltstone	Coring	Highly fractured

Table 2.1.10 subsurface conditions at BH-4

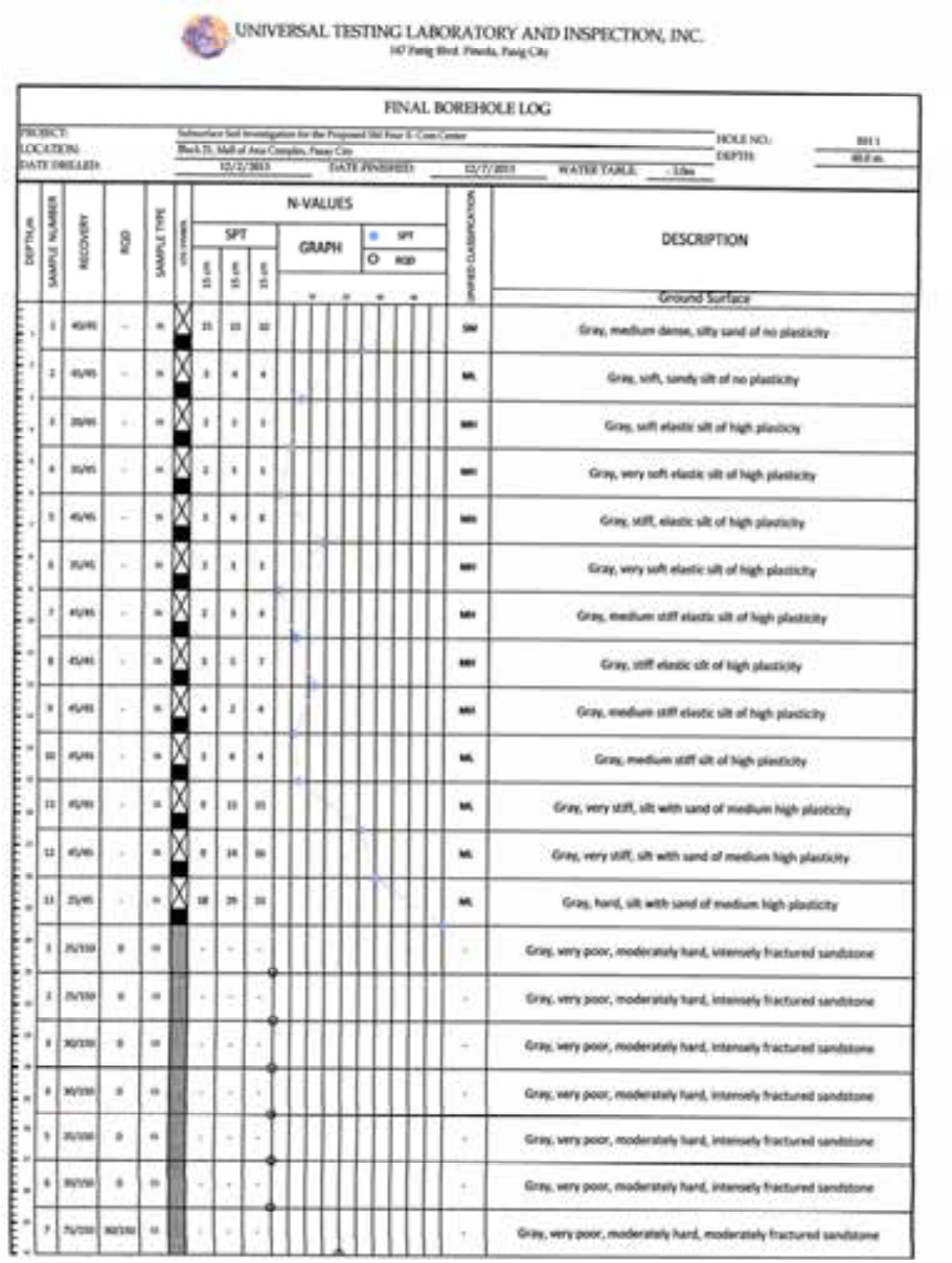
Depth (m)	Soil/rock	SPT N-values	Relative density/consistency
0.0 to 12.0	Sands (SM – SP/SM) and Silts (ML/MH)	2 to 10 [49]	Very loose to Loose/ Very soft to Soft
12.0 to 13.5	Gravel (GM)	'refusal'	Very dense
13.5 to 40.0	Sandstone	Coring	Highly fractured

Table 2.1.11 subsurface conditions at BH-5

Depth (m)	Soil/rock	SPT N-values	Relative density/consistency
0.0 to 13.5	Sands (SM) and Silts (ML/MH)	0 to 8 [14]	Very loose to Loose/ Very soft to Soft
13.5 to 15.0	Gravels (GM)	'refusal'	Very dense
15.0 to 40.0	Siltstone	Coring	Highly fractured

The subsurface materials encountered within the 40.0 m depth of drilling can be generalized as consisting of alluvial soils underlain by weathered rocks. This subsurface condition is consistent with the geology of the area, where alluvial sediments (also referred to as Manila Deltaic deposits) are underlain by weathered tuffaceous rocks that belong to the Guadalupe Tuff Formation (GTF), the regional bedrock.

The thickness of the alluvial layer ranges from 13.5 to 19.5 m. the soils within the upper 12.0 to 18.0 m depth are very loose to loose sands (SM) and soft silts (ML/MH) with SPT N-values ranging from 0 to 0. Transition layers (less than 2 m thick) very dense/hard soils with refusal SPT-N values (N>50) were found before the tuffaceous rocks were encountered. The soils at the transition zone are completely weathered by-products of the GTF. Typical Borehold Log is shown in page **2.1-66 to 2.1-67**.



UNIVERSAL TESTING LABORATORY AND INSPECTION, INC.

FINAL BOREHOLE LOG

DEPTH,m	SAMPLE NUMBER	RECOVERY	RQD	SAMPLE TYPE	USCS SYMBOL	N-VALUES SPT 15 cm	15 cm	15 cm	GRAPH (SPT / RQD)	UNIFIED CLASSIFICATION	DESCRIPTION
											Ground Surface
1	1	45/45	--	N		15	11	11		SW	Gray, medium dense, silty sand of no plasticity
2	2	45/45	--	N		3	4	4		ML	Gray, soft, sandy silt of no plasticity
3	3	20/45	--	N		2	2	1		MH	Gray, soft elastic silt of high plasticity
4	4	35/45	--	N		2	1	1		MH	Gray, very soft elastic silt of high plasticity
5	5	45/45	--	N		3	4	5		MH	Gray, stiff, elastic silt of high plasticity
6	6	25/45	--	N		2	1	1		MH	Gray, very soft elastic silt of high plasticity
7	7	45/45	--	N		2	3	4		MH	Gray, medium stiff elastic silt of high plasticity
8	8	45/45	--	N		5	5	7		MH	Gray, stiff elastic silt of high plasticity
9	9	45/45	--	N		4	3	4		MH	Gray, medium stiff elastic silt of high plasticity
10	10	45/45	--	N		3	4	4		ML	Gray, medium stiff silt of high plasticity
11	11	45/45	--	N		9	11	11		ML	Gray, very stiff, silt with sand of medium high plasticity
12	12	45/45	--	N		9	14	16		ML	Gray, very stiff, silt with sand of medium high plasticity
13	13	25/45	--	N		18	29	31		ML	Gray, hard, silt with sand of medium high plasticity
1	25/150	0	0			-	-	-		-	Gray, very poor, moderately hard, intensely fractured sandstone
2	25/150	0	0			-	-	-		-	Gray, very poor, moderately hard, intensely fractured sandstone
3	30/150	0	0			-	-	-		-	Gray, very poor, moderately hard, intensely fractured sandstone
4	30/150	0	0			-	-	-		-	Gray, very poor, moderately hard, intensely fractured sandstone
5	35/150	0	0			-	-	-		-	Gray, very poor, moderately hard, intensely fractured sandstone
6	35/150	0	0			-	-	-		-	Gray, very poor, moderately hard, intensely fractured sandstone
7	75/150	82/150	0			-	-	-		-	Gray, very poor, moderately hard, moderately fractured sandstone

(Source of Information Sub surface soil investigation of Proposed Four E-com Center) Mall of Asia by Universal Testing Laboratory and Inspection, Inc.)



UNIVERSAL TESTING LABORATORY AND INSPECTION, INC.

FINAL BOREHOLE LOG

PROJECT:
LOCATION:
DATE DRILLED:
HOLE NO.:
DEPTH:
WATER TABLE:

N-VALUES
SPT
GRAPH
DESCRIPTION
Ground Surface
END OF BOREHOLE
LEGEND:

D.R. Mendoza Jr.
Laboratory Technician

D. B. Santos
Manager

(Source of Information Sub surface soil investigation of Proposed Four E-com Center) Mall of Asia by Universal Testing Laboratory and Inspection, Inc.)

Thus, the reclamation methodology will take due consideration of the following aspects:

- The experience of the prospective reclamation/dredging contractor including the equipment that the contractor possesses and will use for the project.
- The properties of the fill materials which most likely will be that from the San Nicholas Shoal.
- The compaction and soil stabilization methodology including among others the application of wick drains to remove moisture and render the reclaimed land homogenous.

The proposed land use and development in respect of the soil (land) properties and capability are generally classified into

- Open Spaces
- Road networks
- Buildings and structures including high rise buildings

The last category will require relatively more stable land form.

Discussions on possible soil contaminations due to project operation. *Potential soil contamination.*

During the Construction Phase

The fill materials will be the soil that will be imported to the reclamation site. Contamination especially with potential hazardous/toxic metallic elements will be effectively minimized because of the following:

- The fill materials will be sourced from within the body of the Manila Bay.
- Containment walls and/or silt curtains will be placed around the reclamation work areas; these will effectively prevent the dispersal of the fill materials.
- Reclamation works will be undertaken in phases such that the impacts will be confined to small areas at a given time.

On the other hand, the undesired sea bed materials from the reclamation site which will be dredged will be disposed most likely at a portion of the Manila Bay, relatively near the project site. Inasmuch as the source and disposal site of these undesired materials is the Manila Bay and further that the disposal site will be provided with containment structures, contamination of the disposal site is not considered as highly significant.

During the Operations Phase

During this phase, the reclaimed land would have been stabilized and consolidated. Thus, if there are any soil contamination this would be immobilized and encapsualted in the reclaimed land.

Soil erosion / Loss of topsoil/overburden USLE/similar modeling when applicable

In general terms, soil erosion refers to the removal of sediment from a particular location by the action of wind or water.

With this project sediment removal from the sea bed is necessary for the soil that is “undesirable” i.e., not possessing the quality needed for sound reclaimed land form. The materials thus removed will be replaced by fill material which at the end of the reclamation works, i.e. soil stabilization will be immobilized.

In this context soil erosion is not deemed significant. Loss of topsoil/overburden/Univeral Soil Loss Equation (USLE) are also not deemed relevant.

Soil/coastal erosion

This is likewise deemed as not significant for the following reasons:

- The reclaimed land form for the 300 hectares is distant from the shore line with a buffer of 200 meters while the 60 hectares reclaimed boundary has no gap with the existing shore line.
- The shorelines are essentially developed and not susceptible to erosion.

2.1.4 Terrestrial Ecology

Terrestrial ecology is deemed not significant or relevant to the project, except in respect of faunal (birds) species in the vicinity of the site, because:

- The reclamation works will be confined at sea.
- Although there are trees standing near the project site, shown in **Plates 2.1.11** these are not going to be disturbed during the construction work.
- These standing trees will not be affected by the access road to the site.
- There are no mangroves near the site. (In fact planting of mangroves is being considered in the initial master development plan).
- The Las Pinas-Paranaque Coastal Habitat and Ecotourism Area (LPPCHEA) are distant from the site as seen in **Figure 3.5 of Section 3 page 3-13**. Nevertheless, some exotic and rare bird species are sighted hovering over the site and immediate vicinity. The final masterplan for the proposed project will consider feasibility of enhancement of bird habitats.

Plates 2.1.11 Standing Trees Near the Project Site





2.2 The Water

2.2.1 Hydrology/Hydrogeology

2.2.1.1 Change in drainage morphology/Inducement of flooding/Reduction in stream volumetric flow;

Drainage map; historical flooding/drought occurrences, stream flow measurements/estimates; Delineation of watershed /sub-watersheds/ floodplain; and identification of aquifers if any; Discuss possible impacts of the project on the occurrence of flooding and vice versa. Consider extreme weather conditions and the PAG-ASA 2020 and 2050 climate projections; Assessment should include potential occurrence or aggravation of flooding in nearby areas.

2.2.1.1.1 Drainage Morphology and Relevance to Impacts on Flooding

BASELINE OF PASAY DRAINAGE SYSTEM:

Several creeks traverse the drainage system of the City of Pasay. The *Tripa De Gallina Creek* is at the boundary of Pasay City and Makati City. Likewise, the *Maricaban Creek* that runs along the Villamor Village and Malibay Estate, is also at the boundary between the two (2) cities. These two watercourses have their confluence in a lagoon at Aurora Boulevard and discharges into Paranaque River and eventually to Manila Bay. In times of rain, these serve as the main drainage discharges of the city. Surface runoff accumulates and cause flooding in low lying areas of the city due to siltation and clogging of the waterways.

Further, majority of the city is drained by the Libertad Pumping Station, Tripa de Gallina Pumping Station, Buendia Outfall and Libertad Outfall. The *Libertad Pumping Station* has a capacity of 42.0 m^3/sec, draining large percentage of the northwestern portion of Pasay City. The *Tripa De Gallina Pumping Station* has a capacity of 56 m^3/sec, and drains about 1,769 hectares of land that extend beyond the boundaries of the city. Part of the runoff from Tripa De Gallina Creek flows into the Libertad Pumping Station via Buendia Outfall, Libertad Outfall and EDSA Outfall. The rest of its waters are discharged into Paranaque River.

On the other hand, no city-wide sewerage system is in place in the city. Wastewater flows into the drainage lines and into the river. Some of the wastewater could infiltrate into the ground and may pose a threat to the groundwater quality. At present majority of the residents and commercial establishments use individual septic tanks for treatment of waste water.

In relation to the proposed project, none of the above identified drainage or sewerage system is within the boundaries of the reclamation project. The Libertad Channel will not be affected despite its mouth being perpendicular to the southern end of the 300-hectare reclamation. There is provided a circulation channel at the mouth of the Libertad Channel with much greater area than Libertad Channel itself.

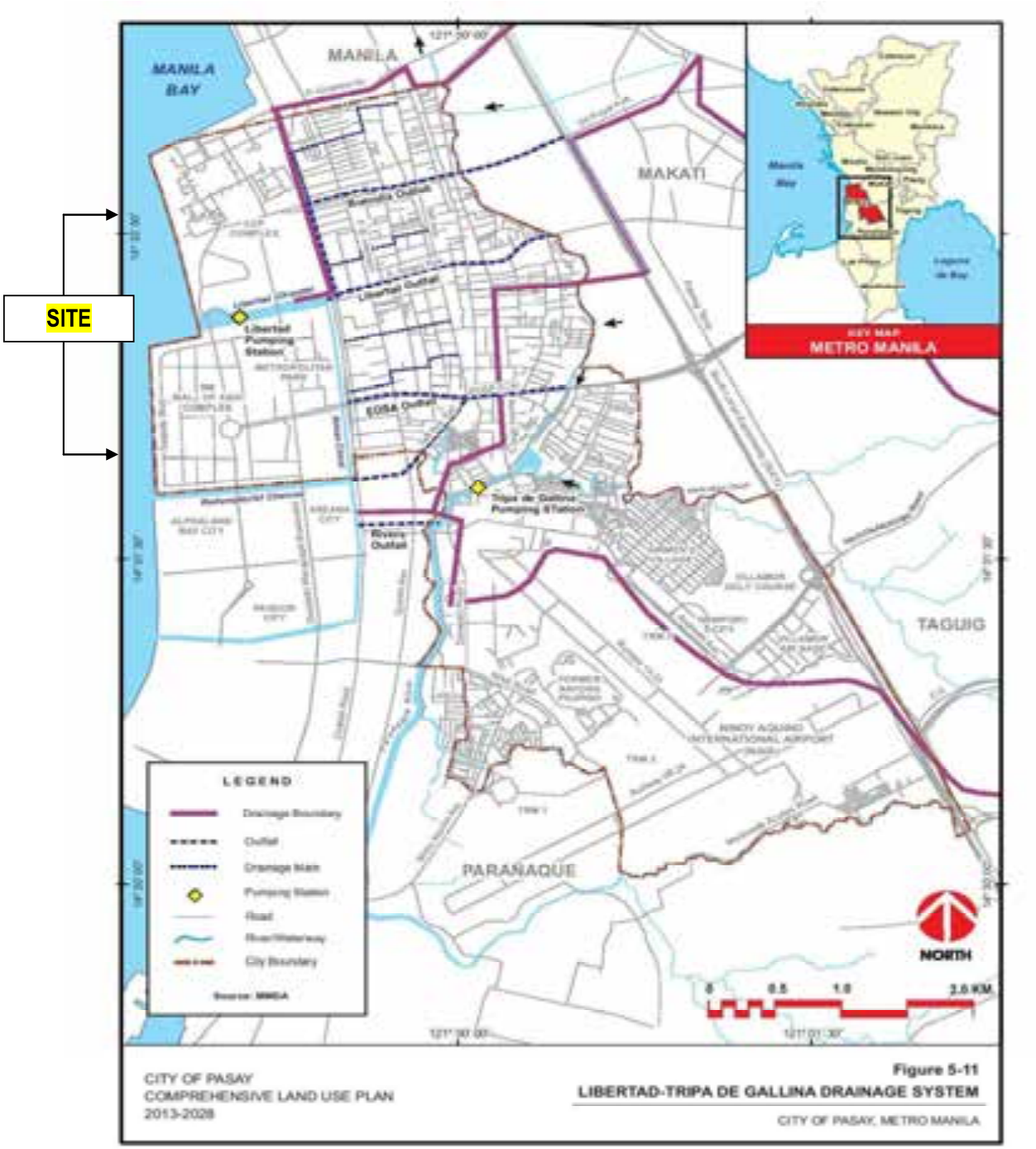


Figure 2.2.1 Libertad-Tripa De Gallina Drainage System

Perceptions or concerns on flooding

Perceptions or concerns on flooding are major issues raised by stakeholders on the project. Articulated in the Public Scoping and Public Hearing conducted for this Project as well as for the other reclamation projects adjacent to the Pasay Reclamation are the causes of flooding hereunder discussed.

Paolo Alcazaren, a respected Filipino Architect has cited the following causes of flooding (*Reference: http://www.newsflash.org/2004/02/tl/tl013599.htm*)

Causes of Floods:

- Ground water extraction due to deep wells.
- Less drainage (areas) than before.
- Esteros, canals and waterways chock-full of informal settlers.
- Main flood control system started in the '70s was never completed.
- Drains and flood control infrastructure is ill-maintained.
- Urban development unplanned.
- Politics.

The drainage system of the City and immediate vicinities is shown in **Figure 2.2.2** from which may be gleaned the following:

- Estero Tripa de Gallina located in the City of Pasay, adjacent to which is installed a pumping station is a major component of the drainage artery. However of the 4.2 hectares surface area of the estero 2.8 hectares (or 67%) are occupied by informal settlers; this significantly immobilizes the drainage function of the estero.

- West of this Estero is the Maricaban creek; however its original width of 21 meters has been reduced to 10 meters (or by more than 50%) also because of informal settlers.

- Downstream of the Estero is another flood control structure prior to final discharge to Manila Bay which is the Libertad Channel and Pumping Station. On this pumping station are installed pumps.

  These pumps, with the existing capacities shown below, however need major upgrading.

  6 x 7 cu.m./sec and
  2 x 1.5 cu.m./sec

- The Libertad Channel, however, has inherent restrictions (a) Small outlet of the flood waters prior to inlet to the Channel and the (b) restricted openings in the channel at the bridge. These are shown in **Plates 2.2.1 and 2.2.2.**

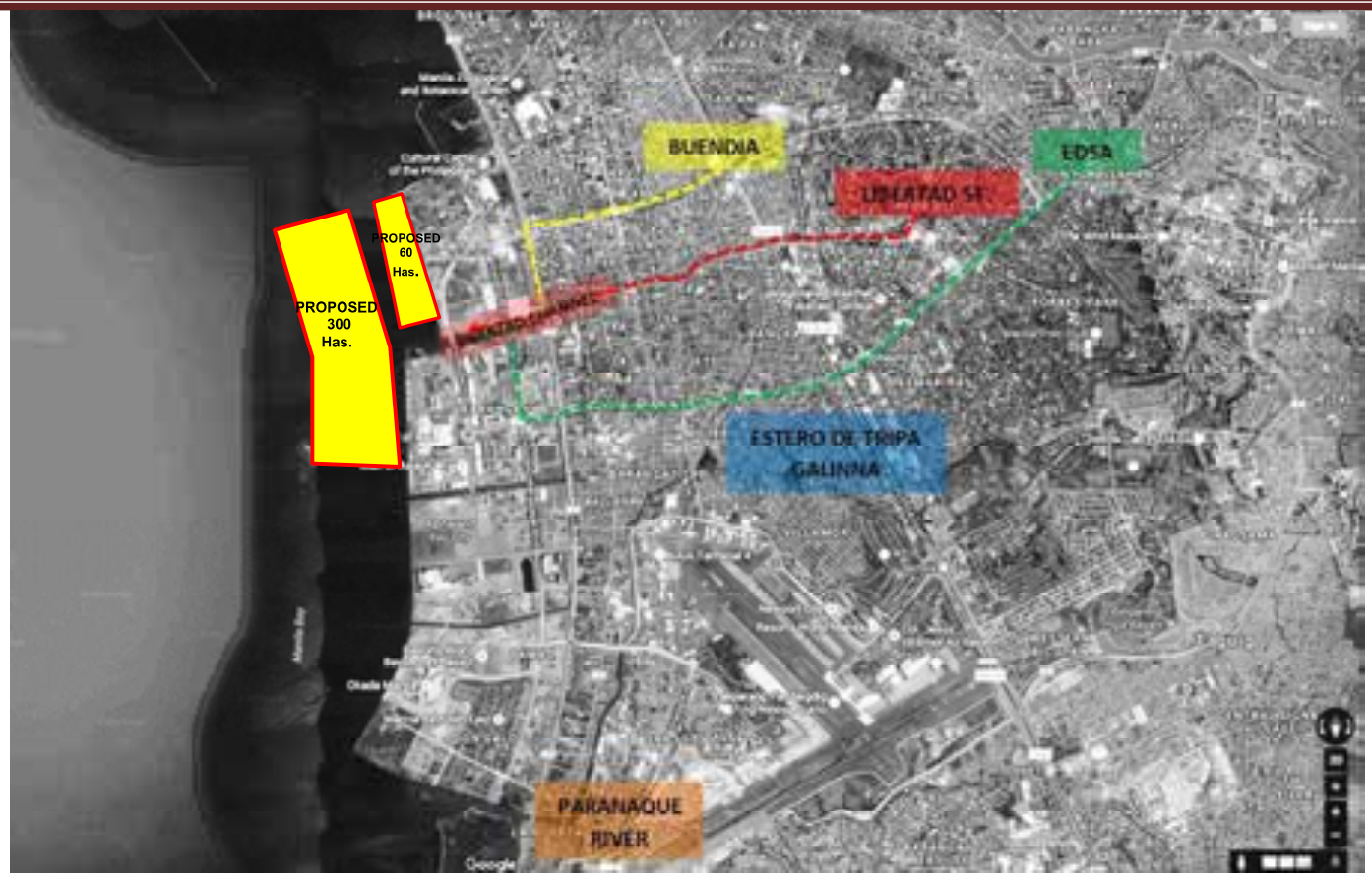


Figure 2.2.2 The Drainage System of Pasay and Vicinities

Plate 2.2.1 The two (2) inlets to the Libertad Channel



Plate 2.2.2 Structures at the Libertad Channel Prior to Discharge to Manila Bay



Inducement of Flooding

The major aspect of the project is that it is downstream of all of the above drainage systems. It does not block, disturb or restrict the upstream storm flows. Thus, does not contribute to an inducement of flooding. Other major factors to flooding are:

- The inlets to Libertad Channel from upstream storm flows are small as may be noted from **Plate 2.2.1.**

- The discharge rates from the pumping stations at the Libertad Channel are limited; it was learned from the MMDA that there are plans to acquire new and high capacity pumps but apparently these have not been implemented yet.

- The reclamation with a platform of 4 meters will in fact have a sheltering effect on storm surges; In addition, wave deflectors will be installed at strategic points. **(**See **Figure 1.16)**

- **On the concern that the deflected storm surge flows will simply be diverted to other portion of the shore causing flood** --It may be noted that the wave energy would have been significantly reduced. This would prevent the water from surging over the coastline noting the differential height between the sea and the land.

- Urban Planners' statement on flooding vis-à-vis reclamation projects: **The reknowned Architect Felino Palafox, Jr. has stated in public that sound reclamation is a solution to Metro flooding.**

  'Reclamation solution to Metro flooding'

  By Sandy Araneta: The Philippine Star Updated October 04, 2012 12:00 AM

  MANILA, Philippines - Land reclamation is the solution to flooding in Metro Manila, Cebu and other urban areas in the country, known architect Felino Palafox Jr. said yesterday.

  Palafox said that reclamation or the process of creating "new land" from oceans, riverbeds, or lakes, can "do the country a lot of good if done properly."

Architect Paolo Alcazaren cited the causes of flooding which are:

- Clogged Esteros (**Figure 2.2.2** shows the esteros system in Pasay City)
- Poor Maintenance of the Pumping Stations

Impairment of the storm flows: The storm flow at the mouth of Libertad Channel is not impaired because adequate channels will be provided in the footprint of the reclaimed land. (See **Figure 2.2.3**)

Stream flow: Measurements/estimates, Reductions in stream flows

- The flow at the Libertad Channel is the only stream adjacent to the project.

- The impact of the project that will be considered in the reclaimed land configuration is potential blockade or restrictions in the flow of the storm water through the channel. Calculation of peak storm water runoff rate from a drainage area is often done with the

Rational Method equation. **(SOURCE:** Impacts of Climate Change upon Asian Coastal Area; The Case of Metro Manila Megumi Muto*)*;

- The stream flow is reckoned as the peak discharge during periods of heavy rainfalls. It is estimated using the Rational Formula.

- The drainage area is calculated from the average width of the channel, multiplied by the length from the "Inflows" shown in the photograph **Plate 2.2.2** to the edge of the 300-hectare reclamation configuration.

- With a width of 18 m, length of approximately 1 km and using as maximum rainfall a value of 1170 x 1.213 = 1419 mm (June July August) based on the PAGASA Climate Change extreme scenarios (2050) the volumetric flow is **0.20 cu.m./sec**.

$$Q = \frac{CIA}{360}$$

Where: Q = peak discharge (m^3/s)

C = runoff coefficient

I = rainfall intensity within the time of concentration (mm/hr)

A = drainage area (in hectares)

Runoff Coefficient (C)

The use of the runoff coefficient implies a fixed ratio of peak runoff rate to rainfall rate for the catchment area. Proper selection of the runoff coefficient requires judgment and experience on the part of the hydrologist/engineer. The proportion of the total rainfall that will reach the sea and/or storm drains depends on the percent imperviousness, slope and ponding characteristics of the surface. Impervious surface, such as asphalt pavements and roofs of buildings, will produce nearly 100% runoff after the surface has become thoroughly wet, regardless of the slope.

Surface Characteristics	Runoff Coefficient
Low (Urban Area)	0.5
Middle (Urban Area)	0.65
High (Urban Area)	0.8
Factory	0.5
Open Space	0.35
Paddy	0.1
Farm land	0.3
Mountain	0.8

Study on Flood Control and Drainage Project in Metro Manila, JICA 1990

Rainfall intensity "I" = 1170 x 1.213 mm/day (June July August) = 50.13 mm/hr

Drainage area (of the Channel) "A" = 18 m x 1,000 m = 18,000 sq.m. = 1.8 has.

Run off Coefficient "C" = 0.8

Q = 0.20 m3/sec

The Libertad Channel is the nearest man-made drainage system to the Reclamation Project shown in **Figure 2.2.3**.

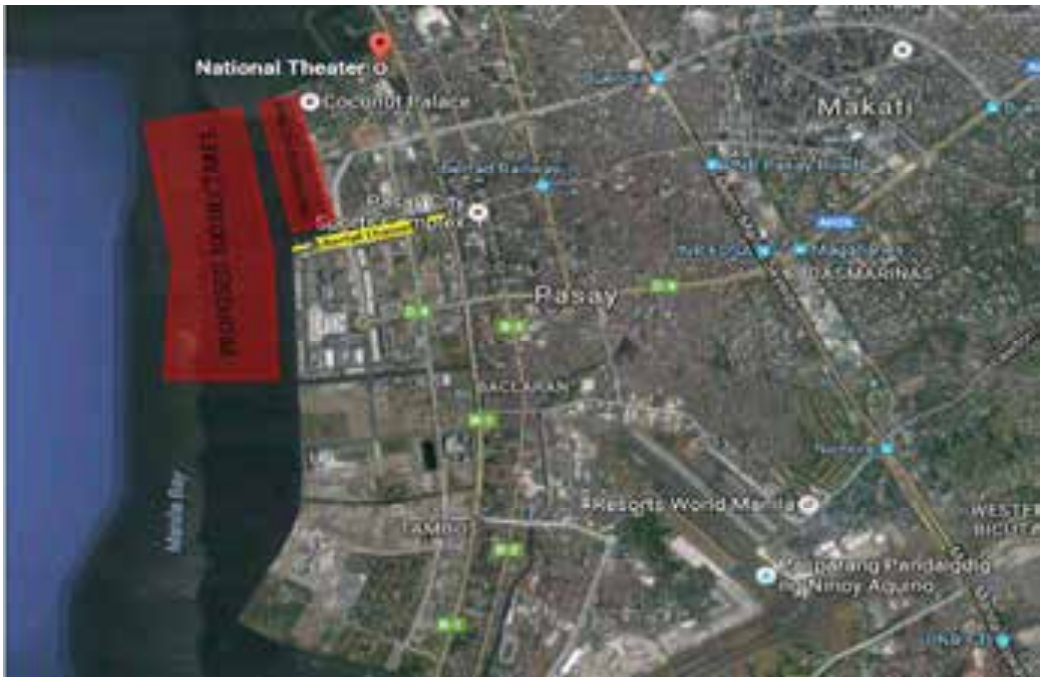


Figure 2.2.3 Project Location/Configuration Relative to the Libertad Channel

Reductions in stream flows can readily be mitigated, by ensuring that the volumetric rate of the storm flow is maintained in the water channels in the reclaimed land. There is a 200 m buffer from the southern portion of the reclaimed land to the shore, it is sufficient to allow for circulation of the Libertad Channel storm flow.

The high volumetric rate scenario is taken from the Climate Change Projections of rainfall intensity shown in **Table 2.2.1** which is 1170.2 mm x 1.213 (% change) for the JJA 2050 scenario:

Table 2.2.1 Climate Change Projections of Rainfall Intensity

	OBSERVED BASELINE (1971-2000) mm				CHANGE in 2020 (2006-2035)				CHANGE in 2020 (2036-2065)			
	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON
NCR												
METRO MANILA	107.5	198.5	1170.2	758.7	-12.8	-33.3	8.5	0.0	-17.3	-38.5	21.3	3.7

Effect of the Project on Stream Flows

The reclamation project does not affect the stream flows of the storm discharges because:

- The Libertad Channel that is adjacent the project and flows directly into the southern boundary of the 300 hectare reclamation, is not blocked by the reclaimed land. A drainage area bigger than that of the channel is available at the mouth of the Libertad Channel, with the creation of a 200-meter buffer zone along the southern boundary of the 300-hectare reclamation.
- The 60-hectare reclamation is along the boundaries of the channel and does not block the channel.
- The other drainage channels shown in **Figure 2.2.2** are distant from the reclamation area.
- The major storm drainage systems in the coast of Manila Bay, i.e. the Pasig River and the Paranaque River are also distant from the project site, shown in **Figure 2.2.4.**



Figure 2.2.4 Map Showing the Distances of the Project Site from Pasig and Paranaque River

Historical flooding/drought occurrences

The historical flooding event of significance was Typhoon Ondoy. The flow of the storm waters during this event is shown in **Figure 2.2.5**. It shows that the project site was not in the path of the flood waters.

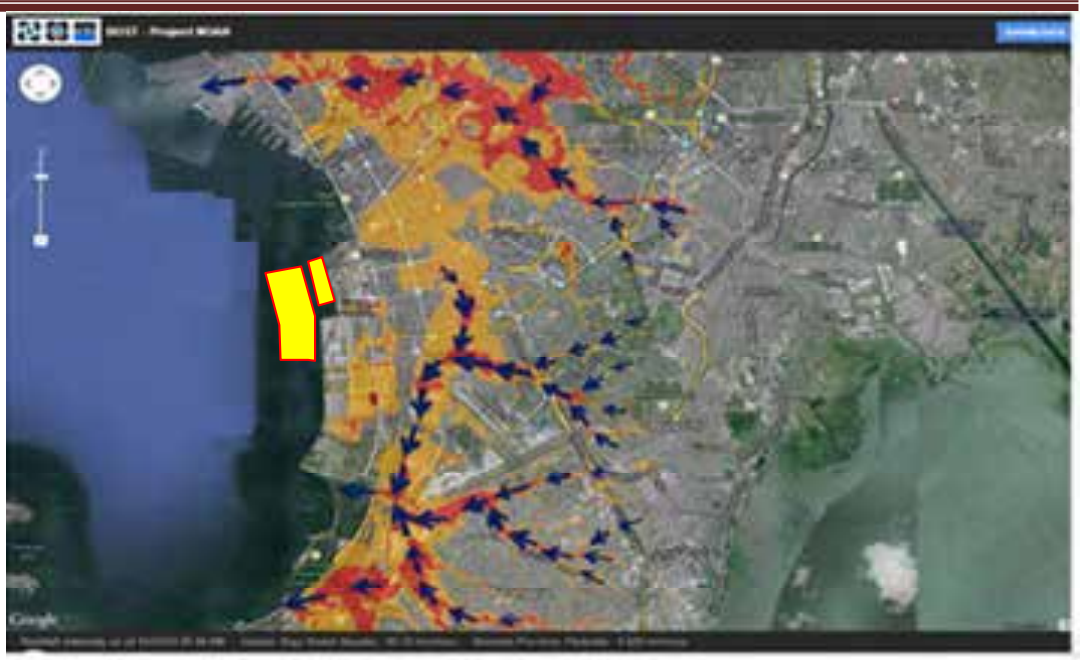


Figure 2.2.5 Pathway of the Ondoy-Induced Floodwater

Delineation of watershed /sub-watersheds/ floodplain; and identification of aquifers if any

By the nature and site of the project, the watershed and flood plains are deemed not significant in respect of project impacts.

In addition, the project will not draw water from underground sources. This is significant in relation to the fact that land subsidence of Metro Manila is attributed to ground water extraction.

Discuss possible impacts of the project on the occurrence of flooding and vice versa. Consider extreme weather conditions and the PAG-ASA 2020 and 2050 climate projections

Flooding may be caused by heavy rainfall i.e. during typhoons that are restricted from flow to the ultimate discharge basin, i.e. the Manila Bay due to the impediments in the drainage morphology discussed in **Section 2.2.1.1.1.** The project does not block, impede or disturb the drainage system and thus does not impact on the occurrence of flooding. The 200-meter buffer zone between the 300-hectare reclamation and the shore and the northern boundary of the 60-hectare reclamation provides a much wider drainage area than that of the Libertad Channel itself.

The other cause of flood is storm surge; it could bring about flood water from the sea. On the other hand, the project is not a cause of storm surges. In fact, the proposed project could shelter the shore areas from flood as discussed in **Section 2.2.2.2.**

Further, flooding will not impact on the reclaimed land itself because of the high finished platform level of 4.0 meters above mean sea level (MAMSL).

Extreme weather conditions and the PAG-ASA 2020 and 2050 climate projections

The same observations are made for extreme weather conditions such as the Ondoy-induced floods i.e., that the project will neither cause or be affected by flood.

The climate-change scenarios which could impact on the project are:

- **Climate-change induced Accelerated Sea Level Rise (ASLR)**

Levels higher than the platform elevation of 4.0 m would inundate the reclaimed land; however, in this scenario the shore lands would also be flooded; these levels are not predicted in the climate change scenarios of ASLRs.

- **Seasonal rainfall changes**

The 21.3% increase in rainfall from the observed base value of 1170.2 mm (JJA) can be apparently handled by the Libertad Channel during the 2050 scenario. Thus, should not cause major flooding in the project site/immediate environs.

Assessment of potential occurrence or aggravation of flooding in nearby areas

The project does not interfere with the drainage system in nearby areas nor does it contribute flood water. As seen in **Figure 2.2.5,** the nearby areas have their own drainage channels.

2.2.1.2 Change in coastal water depth; Regional hydrogeological map

The removal of water columns equivalent to the volume of the reclaimed land will not by itself give rise to changes in water depth; because the same volume of water column is created at the San Nicholas Shoal arising from the dredging of the fill materials.

However, in an event the dredged undesired bed materials will be disposed within the bay near the coast, the water depth at the disposal site will necessarily decrease. The details on the volume of these materials and disposal site will be determined during the course of the geotechnical investigation whereby the nature of the bed materials will be investigated.

Regional Hydrogeology

By way of a short definition, hydrogeology is a branch of geology that deals with the distribution and movement of groundwater in the soil and rocks of the earth's crust. It is commonly called as aquifers. Hydrogeological maps portray information on groundwater and the relevant rock bodies in relation to the earth's surface.

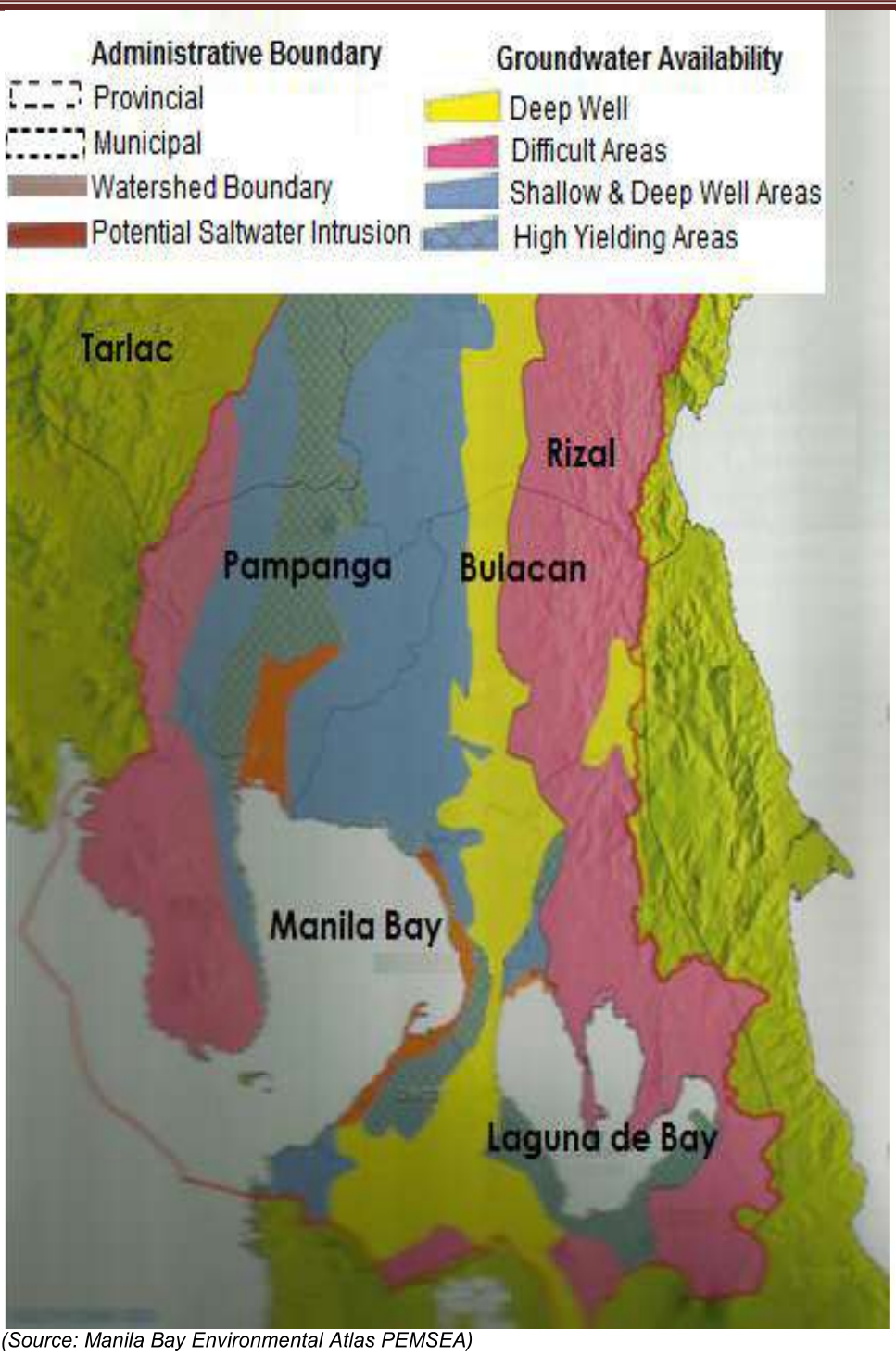
Given the above definition and the facts that

a) The reclamation works are essentially a "dry" process, i.e. no water is required except for domestic purposes and

b) The project will not draw water from the underground

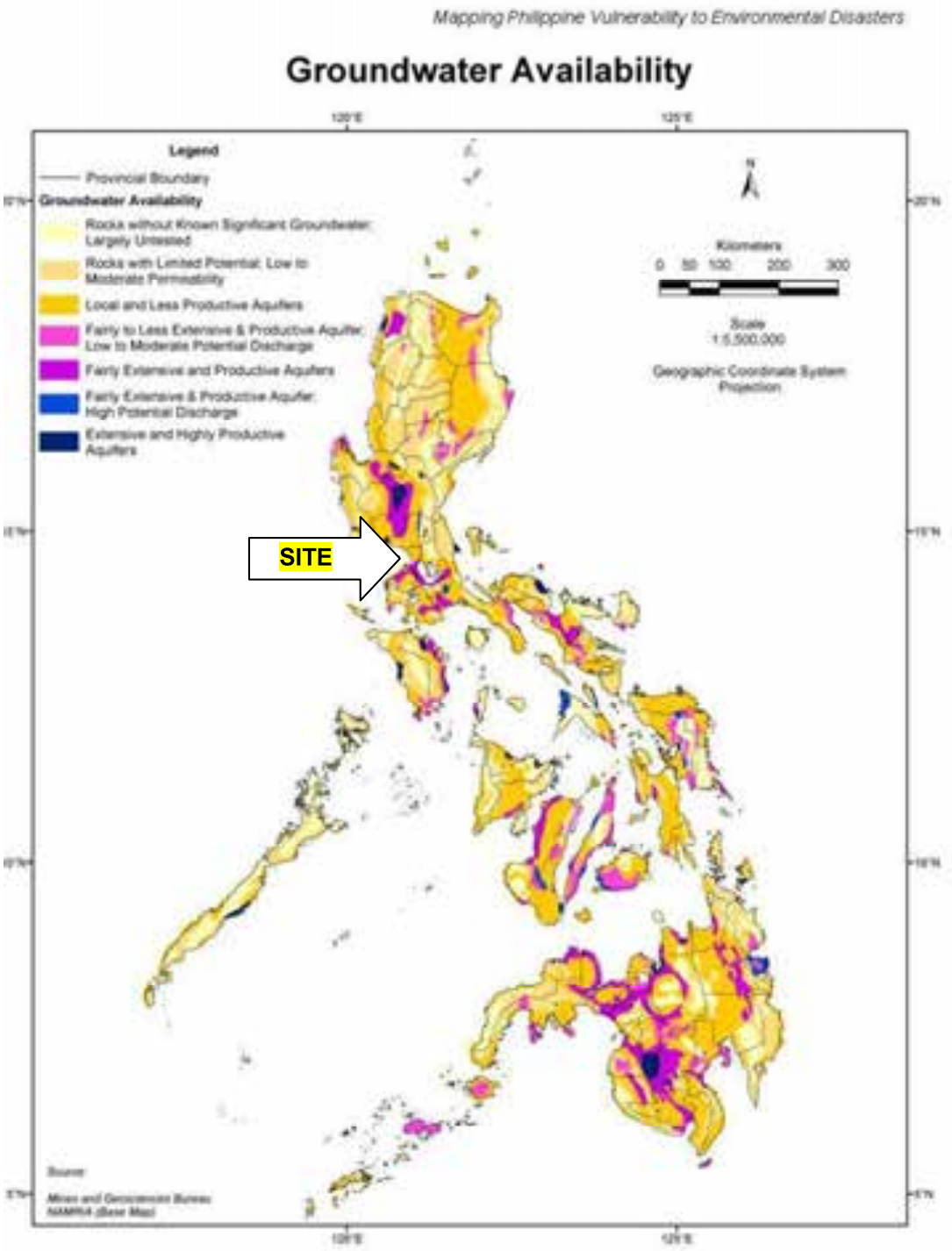
The regional hydrogeology is deemed not a significant aspect of the project.

The Regional Hydrogeological map is provided in **Figure 2.2.6** for reference purposes.



(Source: Manila Bay Environmental Atlas PEMSEA)

Figure 2.2.6 The Regional Hydrogeological/Groundwater Availability Map



(SOURCE: http://vm.observatory.ph/images/Eco_hires/gwater_availability.jpg. Retrieved on August 2014)

Figure 2.2.7 Groundwater Availability Map of the Philippines

2.2.1.3 Depletion of water resources / competition in water use;

Identification of current / projected water use (groundwater/surface water) in the area and adjacent areas; Spring and well inventory and location map; depth of water table; Analysis/estimation of water availability taking into consideration the PAG-ASA 2020 and 2050 climate projections; For project with significant water requirement, conduct water balance / budget analysis (if applicable) and relate to the possibility of depleting water resources.

- **Depletion of water resources/competition in water use**
  - In the absence of major water use by the project and of any underground water abstraction there will be no competition in water use.
  - There are no springs and wells at the site and aquifers are absent; depths of water table are not relevant to this project.
  - The water needs of the construction crew will be provided in bottled water and in small water tanks. The construction crew will be based or housed in the self contained dredging vessels.
  - At the end of the reclamation works and during the period of soil stabilization, crews will be assigned at the reclaimed land for maintenance and security purposes. Water requirements will also be provided them in bottled containers or in small stainless steel tanks.
- **Water Balance**
  - In the absence of water resource competition and the need for underground water abstraction, a water balance is not deemed significant for the project which involves only horizontal developmental activities.

2.2.2 Oceanography

2.2.2.1 Change/disruption in circulation pattern/Predicted tides; 24-hour tidal cycles; Surface current system.

Circulation pattern predicted tides, and the surface current systems are more appropriate discussed in **Section 2.2.2.1.** Provided below are the figures for tide scenarios

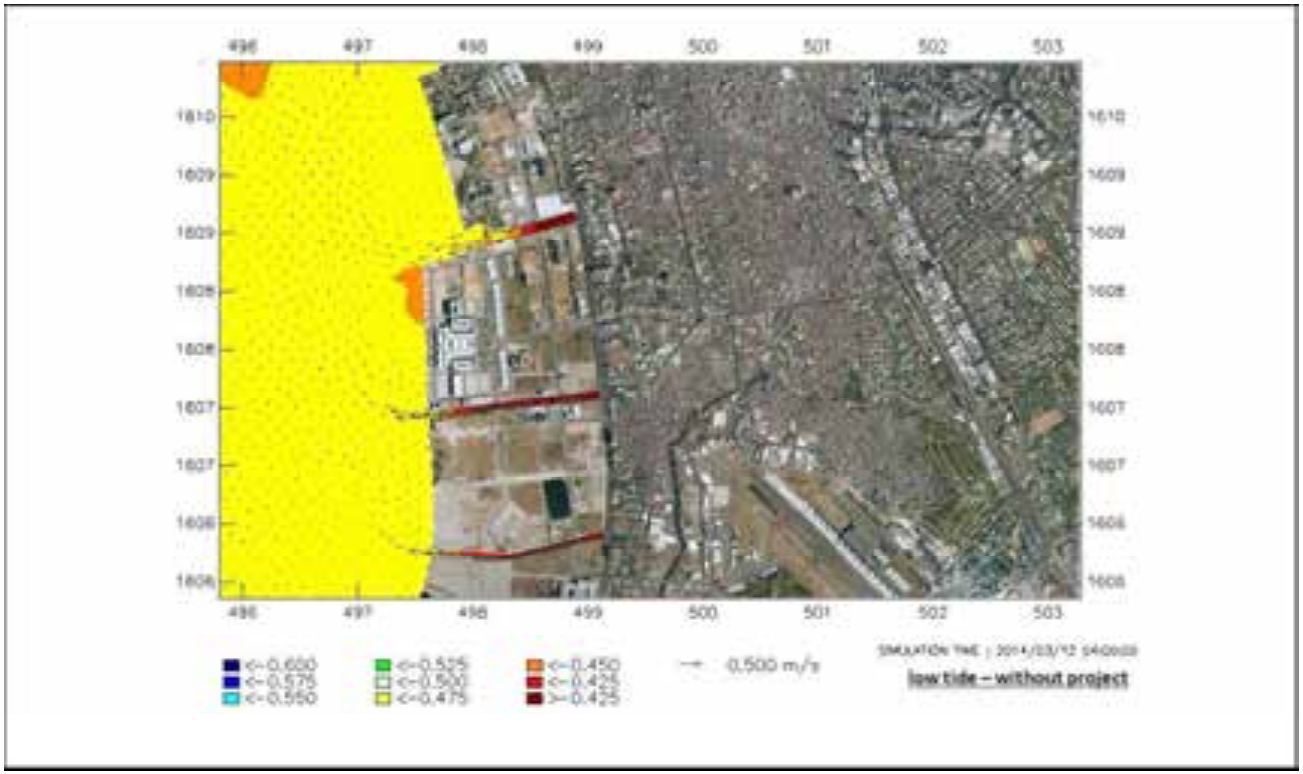


Figure 2.2.8 Low tide scenario without the proposed project

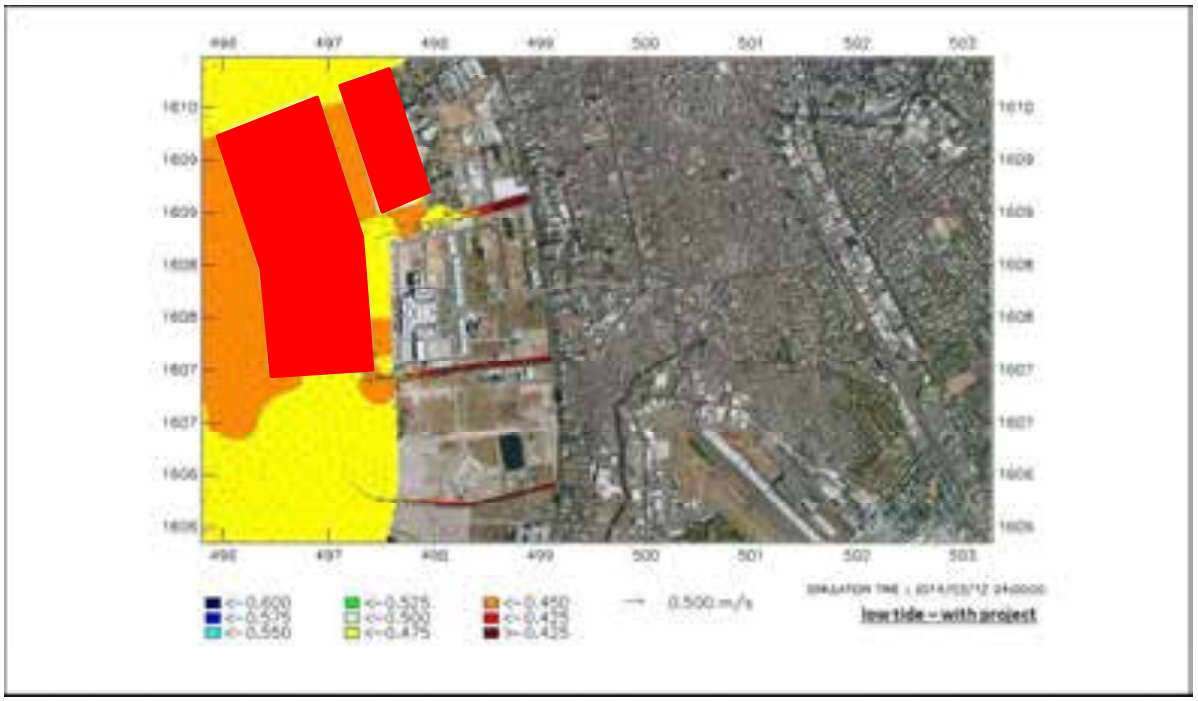


Figure 2.2.9 Low tide scenario with the proposed project



Figure 2.2.10 Low tide changes in water levels

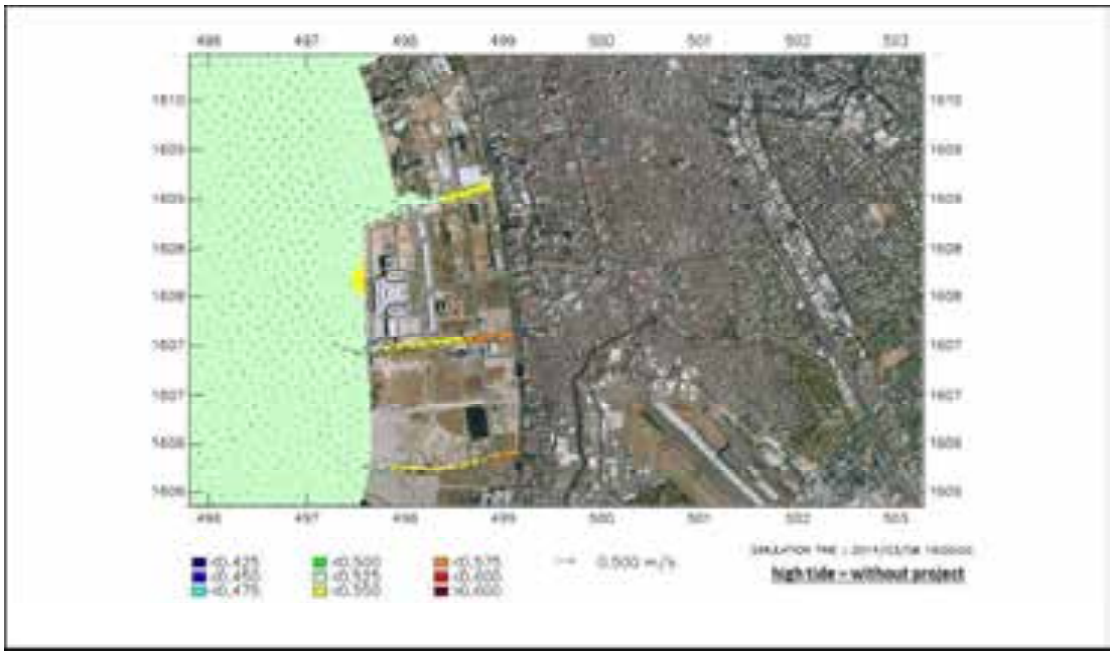


Figure 2.2.11 High tide scenario without the proposed project



Figure 2.2.12 High tide scenario with the proposed project

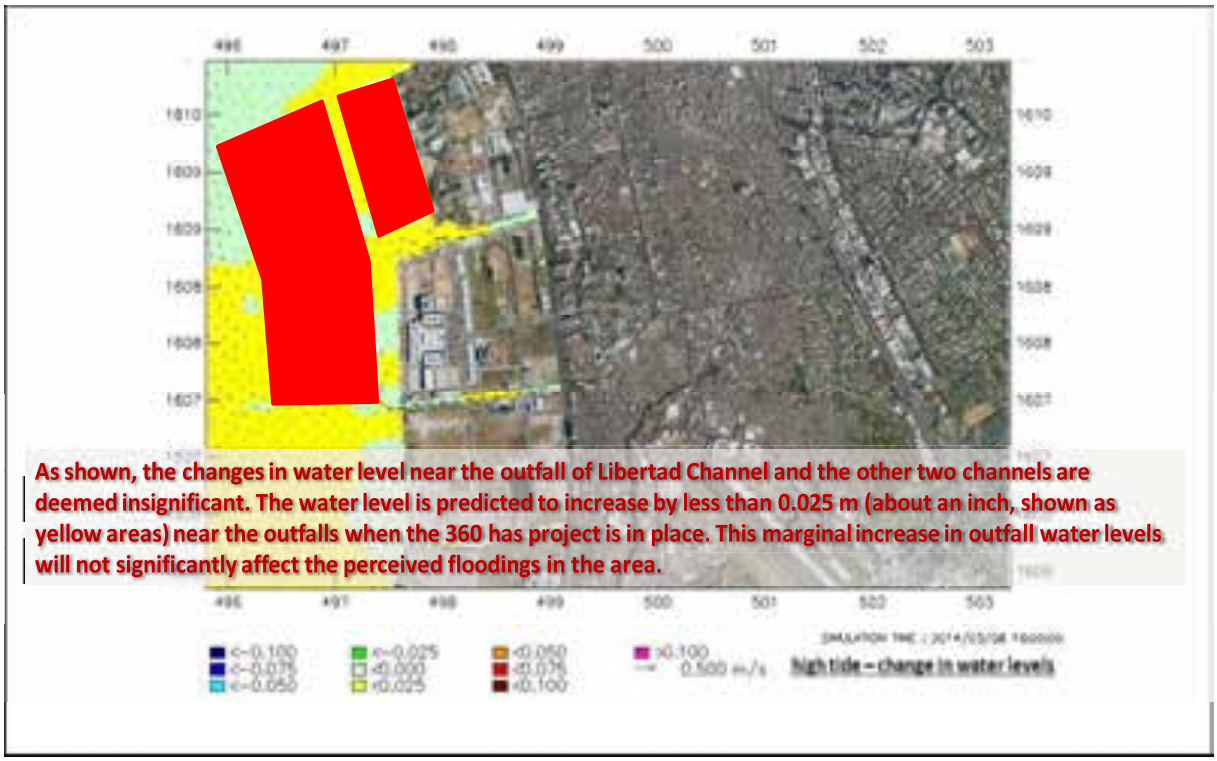


Figure 2.2.13 High tide change in water levels

Circulation pattern predicted tides, and the surface current systems are more appropriate discussed in **Section 2.2.2.1.**

2.2.2.2 Assessment of impact on storm surges and flooding

Storm surge is an abnormal rise of water generated by a storm, over and above the predicted astronomical tides. In view of the Tacloban tragedy brought about by Typhoon Yolanda, this natural phenomenon has attracted nationwide attention and concern and has been raised in Manila with and without reference to the proposed reclamation projects.

While a valid concern for Metro Manila especially along the coasts of Manila Bay, the storm surge in Tacloban City should be viewed differently from a similar event occurring in Manila Bay. Dr. Mahar Lagmay stated during an interview with Bro. Jun Banaag (DZMM, 12 20 a.m. July 17) that there are differences in storm surges; some are smaller than the others. Tacloban and Manila Bay cannot be compared directly because of the following differences in morphology.

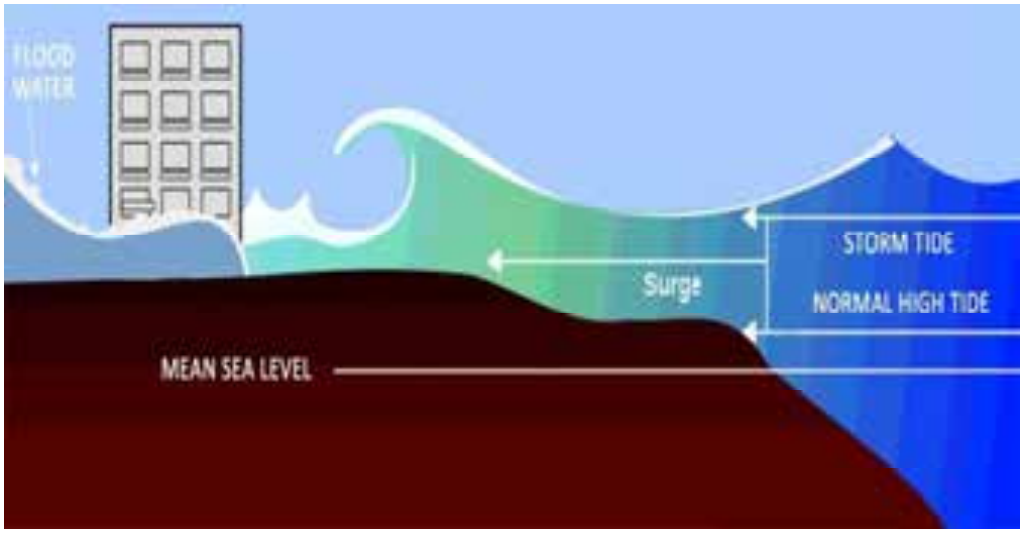
- Tacloban Bay has a larger surface area
- It has a wider opening (55 km) thus bigger volumes of water entering the coastal areas
- It has shallower than Manila bay (depth almost -2 to -4 m), and hence much higher surge
- Its funnel shape concentrates surge

Figure 2.1.28 (page 2.1-56) illustrates these differences.

Assessment of Impacts

Storm surges could occur with or without the reclamation project. The reclaimed land, with a platform elevation of 4.0 meters and a length of 2,498 meters at the side facing the middle of the Bay, may even provide a sheltering effect could thence minimize floods in the coastal areas. This is illustrated in **Figure 2.2.14.**

Moreover, wave deflectors similar to that currently installed in the reclaimed area will also be put in this proposed project. A typical wave deflector is shown in **Figure 1.16** page **1-46.**



In the above illustration without a reclaimed land the surge reaches the shore while with a reclaimed land, shown below the surge is pushed back to the sea.

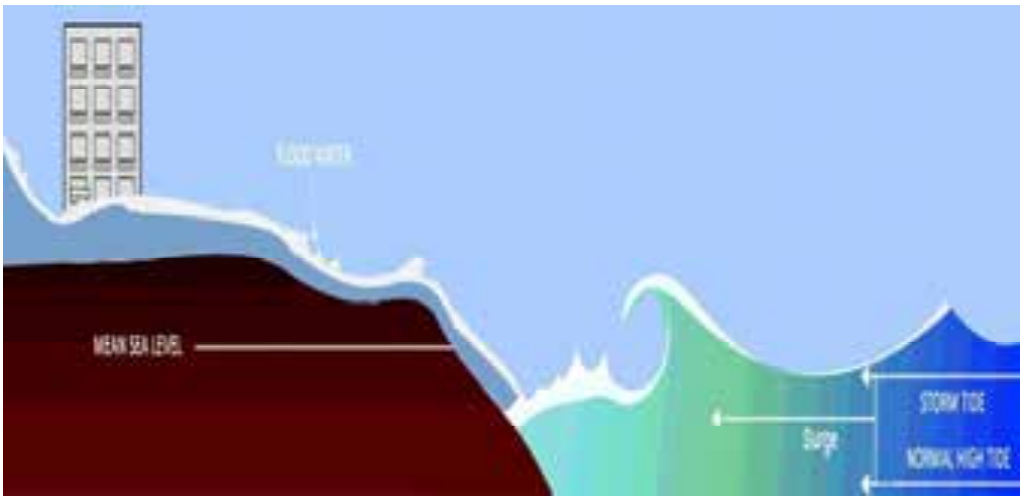


Figure 2.2.14 Illustration of the Sheltering and Flood Mitigation Effects of a Reclamation Project

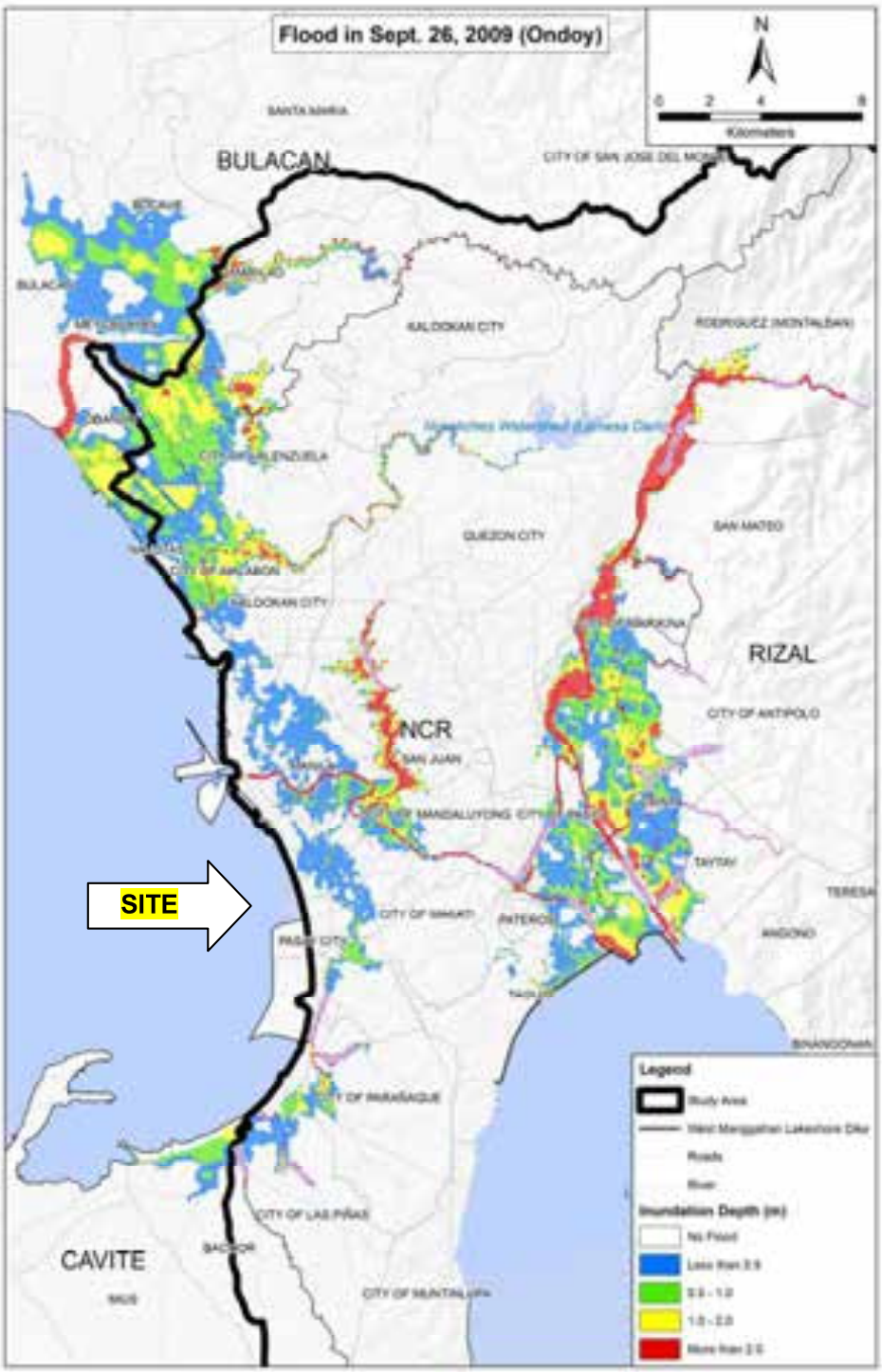


Figure 2.2.15 Simulation of the Inundation from Typhoon "Ondoy"

- **Sand Bags During Typhoon Glenda**

The same concept of sheltering effect was used during Typhoon Glenda during which sand bags were placed at certain sections of the coast of Manila Bay.

Plate 2.2.3 Sand Bags in Manila Bay During the Height of Typhoon Glenda



2.2.2.3 Consideration of Littoral Transport

In general terms "littoral transport" is the movement of sediments in the near shore zone through the action of waves and currents. The sediment may up drift to the coastline, thereby causing erosion or changes in the beach profile. Such movement could also reach outward to the sea where there may be significant population of fish. The sediments could cause turbidity rise and the dispersal of the contained elements (e.g. metals) which could potentially be harmful or toxic.

Impacts of the Project

The project activities that are relevant to littoral transport are (a) dredging of the sea bed to remove undesired sea bed materials and (b) filling of the dredged area with suitable materials.

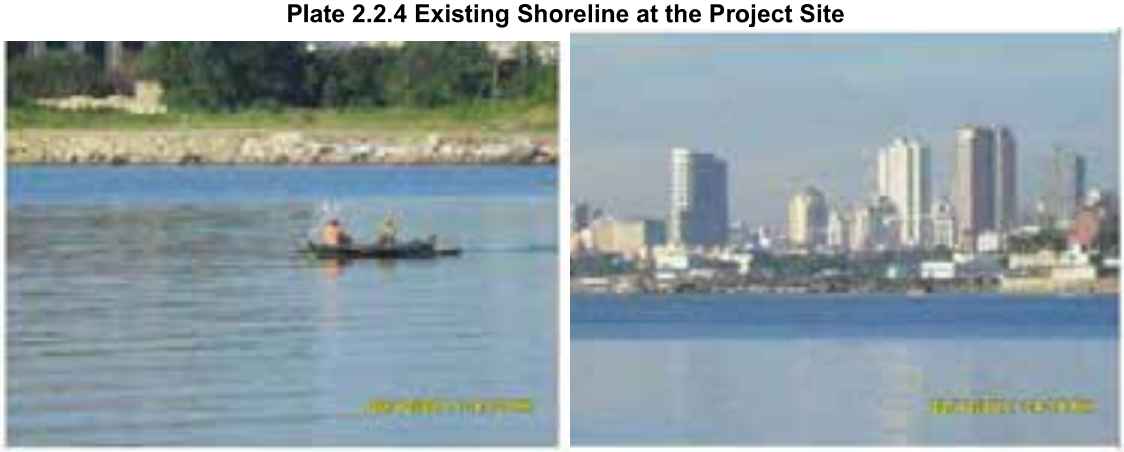
The corresponding impacts are:

- **Erosion** - the removal of sediment from the reclamation site. This cannot be avoided. However, when the area has been reclaimed the bed underneath the reclaimed land will no longer be subject to erosion.

- **Accretion** – the deposition of the disturbed sediment to the shoreline. The impacts are both relatively insignificant and readily manageable because.

The existing shoreline at the project site is already developed seen in the photographs below.

Plate 2.2.4 Existing Shoreline at the Project Site





SEAWALL ALONG SOFITEL



SEAWALL ALONG THE COCONUT PALACE

Moreover, silt curtains or containment walls will be installed to prevent sediment dispersal. The reclamation will be undertaken in phases which will minimize the impacts of the dredging and filling operations.

2.2.2.4 Discussion possible micro-climatic change, global warming, accelerated sea level rise (due to potential global warming climatic effects)

Change in local climate (microclimate), e.g. temperature

In broad terms, microclimate refers to the climate of a very small or restricted site/area, especially when this differs from the climate of the surrounding area. Temperature is one of the key aspects of microclimate.

"Microclimate pertains to local climatic patterns which are superimposed on the global pattern as a function of geography and topography. The primary geographic variables are latitude and longitude. For example, the Philippine's climatic characteristic is tropical because of the archipelago's location relative to the warm equator. As a result, the country generally experiences pronounced dry (summer) and wet (rainy) seasons. However, because of differences in topography, sizes and positions relative to large water bodies and other oceanographic parameters, the country is further characterized into four distinct climatic zones.

- **Effects of the Project on Temperature Rise**

Temperature rise could be influenced by rainfall and wind pattern changes.

- **Effects of Diurnal rainfall variation**

The diurnal variation of rainfall at any tropical location is determined by a combination of many factors such as radiation heating and cooling, land-sea breeze effects, topography, tidal effects, frequency of synoptic disturbances, among others. Local circulations such as land-sea breeze, mountain-valley winds, and radiation surface-heating may be of secondary importance, at least during the months of maximum rainfall. Radiational heating refers to atmospheric heating caused by solar radiation being readily transmitted inward through the earth's atmosphere. During the transition months between the wet and dry seasons, surface heating is greater (due to the reduced cloud cover) and maybe more important in determining changes in daily rainfall.

- **Effects on wind pattern**

The project area of 360 hectares (3.6 km^2) is significantly small compared to the area of the Manila Bay of 1,994 km^2 and thus is not seen to cause changes in the wind pattern.

Overall, the project is not expected to cause microclimate effects particularly on temperature.

- **Effects of the Project on Global Warming**

The potential impacts on global warming is reckoned from the combustion of fossil fuel (diesel oil) used in the Trailer Suction Hopper Dredger (TSHD).

Carbon Dioxide Emission

The sources of carbon dioxide emission from the project as may be gleaned below are the fuels used in the operation of heavy machinery and equipment such as dredgers, pile drivers and the barges. These are considered minor in terms of the global inventory, in addition to the short term use of these units. Although there are no calculations at this time estimating the amount of fuels and thus of CO2 that would be generated by the various reclamation/construction equipment, this statement is made from the macroscopic perspective of total net country CO2 emission which per the NFCC report is negative (-32,936.45 gg), i.e. net of LUCF.

Basis for estimation of CO2

Hopper Capacity	=	46,000 m3
Propulsion Power	=	38,400 Hp
Pumping Power	=	16,000 Hp
Speed	=	18 kn = 33.34 km/hour
Distance to San Nicolas Shoal	=	25 KM
Time Cycle per 46,000 m3 fill	=	(25/33,34) x 2 + 3 hours = 1,5 + 3 = 4 hours

Kw-hr consumed = (38,400 x 0.745) x 1.5 + (16,000 x 9.745) x 3 = 42912 +35760 = 78672 kw hr/46,000 m3 fill

For 100 000 000 cu.m. fill

Kwhr = (78762 / 46,000) x 100 000 000 = 171 221 739 kw hr

Fuel consumption ≈ 2 gal (38,400/40) x 1.5 + 2 (16 000/40) x 3 =2,880 + 2,400 = 5,280 / 46 000 m3 fill or 11 478 260 gal

Unit Carbon dioxide generation = 2,778 g x 3.66 x 0.99 = 10,084 g/gal diesel oil Grams CO_2 generated 114 782 600 grams or 57 391 385 grams per year = 57 thousand tons/year

Inventory of top 15 country emitter = 21,371,218 thousand tons per year
Contribution of project = minimal

During the period that the reclaimed land is allowed to settle to gain integrity, there will be hardly any carbon dioxide emissions because there will be no significant activities at the reclamation area.

It is thus concluded that the project is not associated with significant ghg's.

It is thus seen that the project will not cause appreciable effects on the global warming phenomenon.

- **Accelerated Sea Level Rise**

There are various sea level rise scenarios predicted for Manila Bay. Assuming a worst case scenario of 2 m SLR ("Integrating Climate Change and Disaster Risk Scenarios Into Coastal Land and Sea Use Planning in Manila Bay" June 2012, PEMSEA) it is herewith submitted that the Reclamation Project will not itself contribute to the accelerated sea level rise for the following reasons:

- The volume of sea water replaced by land is compensated by the same volume of sea water created during the dredging of the fill materials in Manila Bay.
- The volume of sea water replaced by land (0.036 Cu.Km.) is dissipated in the China Sea which has a volume of 9,880,013 Cu.Km. illustrated in **Figure 2.2.16**.

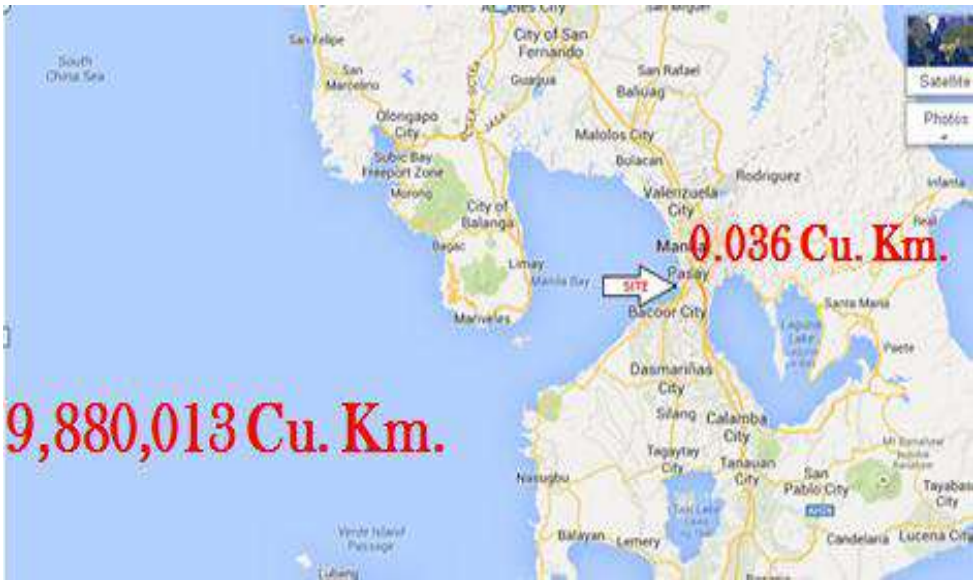


Figure 2.2.16 Illustration of the Dissipation of the Sea water Displacement in the China Sea

2.2.2.5 Study of coastal hydrodynamics with focus on the following:

Erosion, sedimentation and accretion
Sediment dispersion and sediment transportation

This has been discussed in **Section 2.2.2.5.**

Impacts on water level
Changes in bathymetry impacts on sea traffic movement and safety. Changes in bathymetry

The general bathymetric profile of the Manila Bay is shown in **Figure 2.2.17**, while the bathymetric profiles in the 60-hectare and in the 360-hectare sites are shown in **Figures 2.1.12 to 2.1.14** page 2.1-28 to 2.1-30.

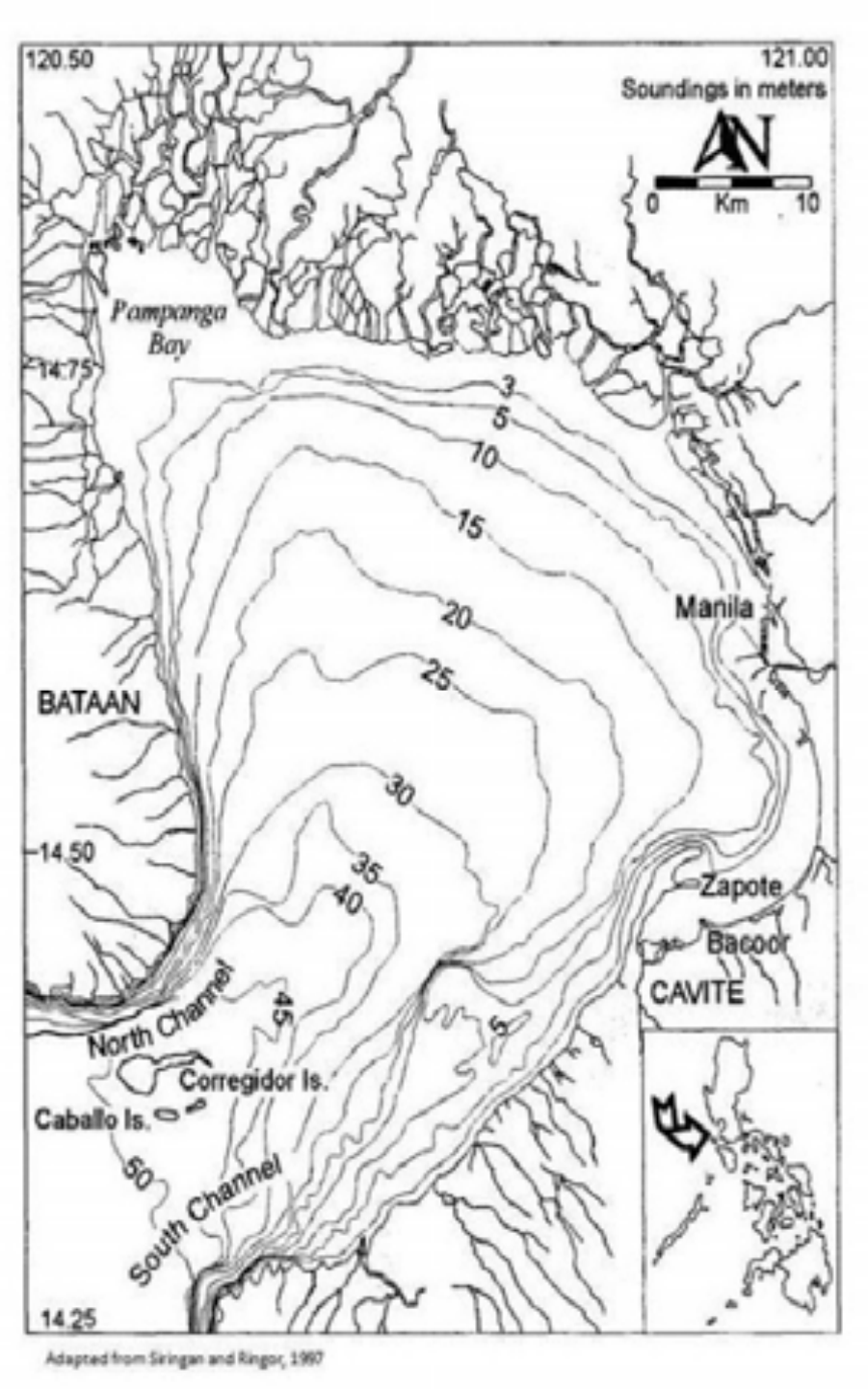


Figure 2.2.17 General morphology and bathymetry of Manila Bay

Impacts:

The reclamation sites will lose the water, but in entirety the Manila Bay bathymetry will not change. This is because similar to the discussions on sea level rise. The replacement of the water is compensated by the creation of water at the dredging site and the water displaced is extremely small in comparison to the China Sea which will dissipate the impact of this water volume loss.

Sea traffic movement and safety

The site is not used for navigational purposes except as access water ways for some boat fisher folks. The reclamation activities will be confined to the project site and immediate vicinities and also the sea lane to which the dredger vessel will navigate. This sea lane is not affected by the reclamation works

The vulnerability of lift nets to potential damage by cruising dredging vessel is discussed in **Section 2.2.7.**

Impacts on long-term shoreline changes

The shoreline of the 60-hectare reclamation will permanently change as shown by the illustration below; however due to the recession of the boundaries of the 300-hectare reclamation; there will be no impact on the shoreline.



Figure 2.2.18 New Shoreline Created

Impacts on coastal morphology
Impacts on current flow trends and velocities
Changes in wave patterns

Hydrodynamic simulations

The Hydrodynamic Simulations in **Section 2.2** discuss the impacts on coastal morphology, current flow trends and velocities and in wave patterns

Numerical Model Theoretical Background

The dynamics of the coastal environment warrant the need for proper hydraulic design considerations of coastal structures. As the nature of the coastal environment is dynamic and large-scale, the need for spatial and temporal detail of analysis necessitates the use and application of numerical simulation models. Numerical models of physical processes serve as powerful tools for assessing quantitatively hydrodynamic (and water quality) conditions. Numerical models extend the spatial and temporal limits of field observed information for a more detailed and comprehensive engineering analysis. In dynamic ecosystems like that of the coastal environment, models allow simulation of management/engineering project alternatives without inadvertently causing undesirable changes to the ecosystem.

The current patterns in the coastal area off the vicinity of Manila Bay in Pasay City were studied using a two-dimensional non-linear numerical model of the coastal zone (using Delft3D of Deltares). The oceanographic model for the currents and sea surface elevation is essentially based on the shallow water equations derived from the two-dimensional (2D) Navier-Stokes equations for an incompressible fluid using the shallow water and Business assumptions as well as the continuity equation. The formulations allow the inclusion of the non-linear interaction between the wind and the tide.

Approach

Numerical modelling for the 60 hectare project was first undertaken. The boundaries of this phase are well defined. Results are evaluated as to significance of impacts and if none are observed, extrapolations are made to include both the 60-hectare and the 300-hectare phases.

The governing equations of the present coastal circulation model are written in the Cartesian coordinate system as:

Conservation of momentum in x-direction:

$$\frac{\partial u}{\partial t}+u\frac{\partial u}{\partial x}+v\frac{\partial u}{\partial y}+g\frac{\partial \eta}{\partial x}-fv+\frac{gu\sqrt{u^2+v^2}}{c^2(d+\eta)}-\frac{F_x}{\rho(d+\eta)}-v_t\left(\frac{\partial^2 u}{\partial x^2}+\frac{\partial^2 u}{\partial y^2}\right)=0 \quad (1)$$

Conservation of momentum in y-direction:

$$\frac{\partial v}{\partial t}+u\frac{\partial v}{\partial x}+v\frac{\partial v}{\partial y}+g\frac{\partial \eta}{\partial y}+fu+\frac{gv\sqrt{u^2+v^2}}{c^2(d+\eta)}-\frac{F_y}{\rho(d+\eta)}-v_t\left(\frac{\partial^2 v}{\partial x^2}+\frac{\partial^2 v}{\partial y^2}\right)=0 \quad (2)$$

Conservation of mass, also known as the continuity equation:

$$\frac{\partial \eta}{\partial t} + \frac{\partial[(d+\eta)u]}{\partial x} + \frac{\partial[(d+\eta)v]}{\partial y} = R - E + q \quad (3)$$

where u and v represents velocity ($m.s^{-1}$) in the x- and y-axes, respectively, η is the water surface elevation (m), d is the still water depth (m), Fx,y is the x- and y- components of external forces (Pa) (i.e., wind stress), f represents the Coriolis parameter (f = 2Ω sin θ), where Ω is the earth's angular velocity and θ is the geographic latitude ($rad.s^{-1}$), g is the acceleration due to gravity ($m.s^{-2}$), ρ is the water density ($kg.m^{-3}$), νt is the eddy viscosity ($m2.s^{-1}$), c is the Chezy coefficient ($m^{1/2}.s^{-1}$), R refers to direct rainfall rate ($m.s^{-1}$), E is the rate of evaporation ($m.s^{-1}$) and q represents the river discharges and withdrawal of water ($m.s^{-1}$).

The surface stress term is assumed as a quadratic function of the wind W with components in the x and y -axes given by

$$\tau_{sx} = \rho_a c_d W_x W \quad , \quad \tau_{sx} = \rho_a c_d W_y W \quad (4)$$

where ρa is the air density, cd is a drag coefficient and Wx,y are the wind components in the x and y-axes, respectively.

Equations (1) and (2) define the current accelerations in the x and y-axes respectively. The first terms on the left of both equations represent the local change of the flow velocities. The following terms on the left represents changes in the fluid acceleration due to advection of momentum. On the right hand side of both equations (in the order written), effects due to earth's rotation (Coriolis acceleration), sea surface elevation gradient, surface stress and bottom frictional effects, and horizontal momentum diffusion provide the necessary physical factors affecting coastal circulation. Basically, these equations represent conservation of momentum in the coastal sea. Current velocities are predicted using these equations.

On the other hand, Equation (3), which is simply the equation of mass continuity, represents conservation of water mass. It predicts the evolution of the water level or sea surface elevation from known current velocities due to the wind and the tide.

Modeling Approach and Set-up

Hydrodynamic conditions near and around the project area are influenced by various factors such as tidal fluctuation, prevailing wind stress, density gradient, coastal geometry and bathymetric heterogeneity. As such, the model formulations took into account the following processes: free surface gradient by tidal forcing, wind shear stress, the effect of the earth's rotation, bed shear stress and turbulence-induced mass and momentum fluxes.

For shallow coastal environments such as that of the Manila Bay, bathymetry (bottom water topography) is a crucial input for studying hydrodynamics. Bathymetric information of the study area was acquired from available bathymetric data outsourced from NAMRIA and from the bathymetric survey of the Proponent. Bathymetric points were digitized and extrapolated to coincide with the model domain and serve input to the model simulation. The coastal boundaries were established for which the computational model domain was based. Computational grid cells along two horizontal directions were then generated for this model domain where depths are recorded inside grid cells. This comprises the bathymetric data.

Tidal variation is another important input to the hydrodynamic model. Considering the limited observed information locally, and to incorporate accordingly the effects of varying tidal fluctuation as well as the complicated topography of the region, model boundaries were particularly specified at locations with observed tide conditions. The finest data should come from actual tidal records; fortunately the area is near the Manila South Harbour Station of which tidal water level records are available.

A typical tidal variation in the project area is provided in the **Figure 2.2.19**. As indicated, the tidal range exceeds 0.80 meter fluctuation between spring and neap tides.

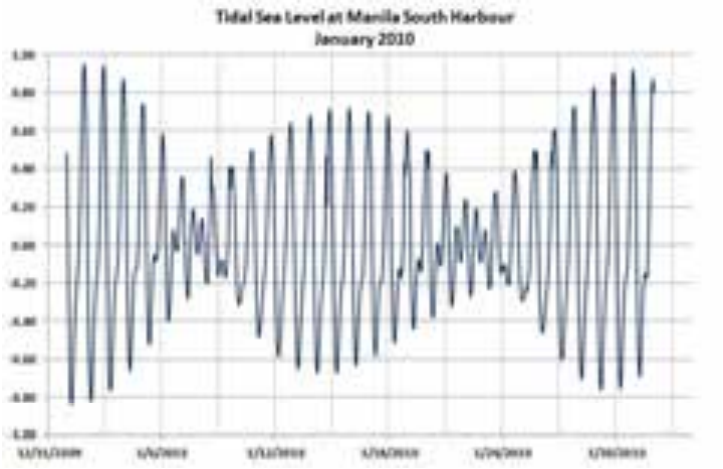


Figure 2.2.19 Observed tidal heights (m) in Manila Bay for January 2010

Wind is a principal driving force for most coastal processes and therefore constitutes another vital information for the model. The action of wind normally modifies the tide-driven motion of the coastal sea and therefore requires accurate information. A temporally varying uniform wind input is normally adequate (conservatively) to represent surface wind stress in hydrodynamic modeling but a spatially varying wind speed is recommendable if available.

Computational Grids

From the geometry of the coastal area, the computational grids of the model domain were constructed. Grids are basically a structured set of virtual points covering the model area where mathematical computations are carried-out and on which simulation results are obtained. The detailed model, with a finer grid resolution of about 30 m x 30 m is shown in **Figure 2.2.20**.The astronomical tidal constituents were imposed as boundary forcing at the open boundaries of the regional model. The simulated water levels and flow velocities from this regional model were then recorded, bi-linearly interpolated, and applied at locations along the open boundaries of the nested model representative of the Manila Bay coastal environment. Boundaries for the regional domain were particularly specified at locations with observed tide conditions.

Shown **Figure 2.2.20** is the area model superimposed on the coarser regional model.

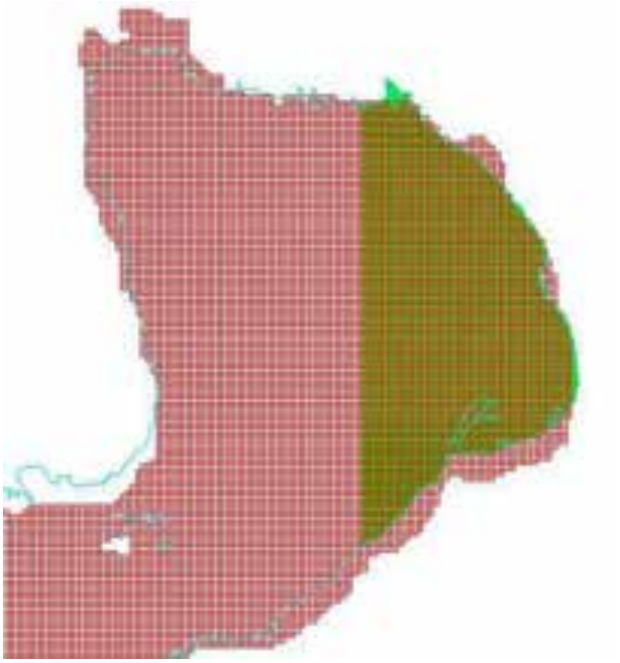


Figure 2.2.20 Regional model grid (red) and area model (green) used in the generation of appropriate boundary conditions for the detailed model

Finally, a fine resolution grid was developed near the coast where the proposed project site is located. It was developed using a curvilinear grid structure, which allowed the generation of fine resolution computational mesh to accordingly follow coastal (and proposed reclamation) configuration and be consistent with the tidal streamline structure in the Bay. Grid sizes in the order of 45 m were adopted in the detailed model domain, with higher resolution mesh in the order of 25 m at spaces between piers.

All major influences on hydrodynamics of the outer regions were incorporated into the detailed models. The initial conditions for initiating the hydrodynamic computations of the detailed models were based on the computations of the regional model.

The fine resolution grid is shown in the **Figure 2.2.21**.

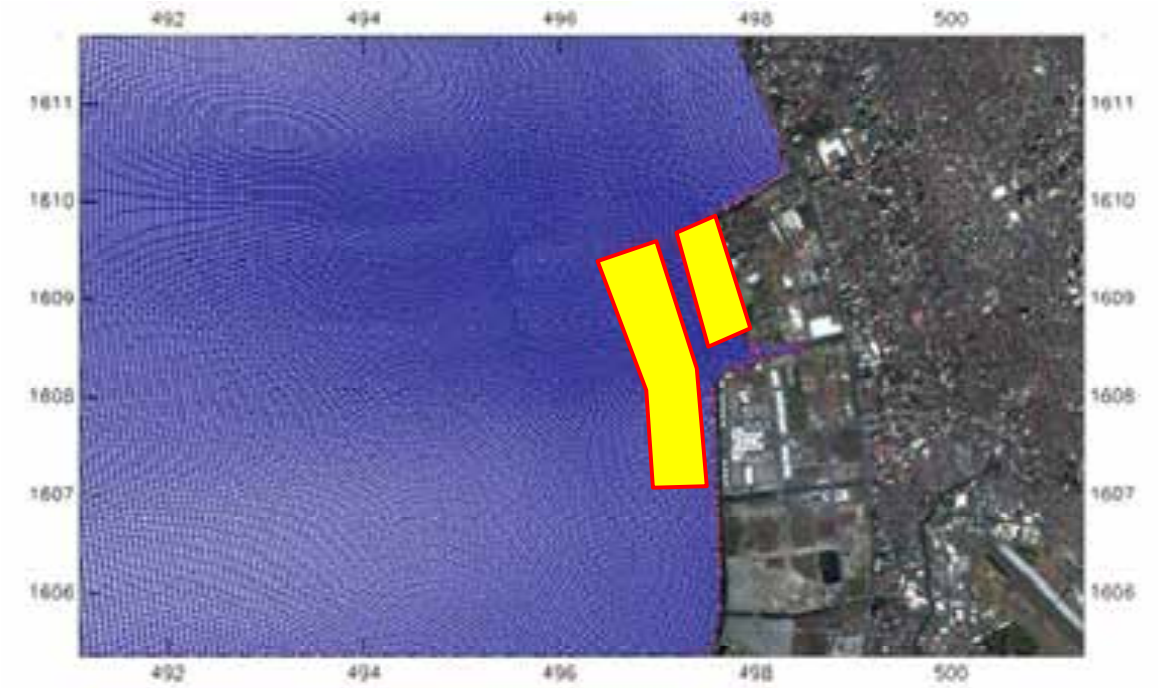


Figure 2.2.21 The final detailed model used in the simulation and the coastal boundary line and proposed reclamation outline (in red line).

Modeling Inputs and Scenario Settings

To assess the impact of coastal development such that of the 60-ha Pasay reclamation on current circulation and pollutant dispersal patterns in the area, scenario simulations were executed for comparative analysis. Grid cells coinciding to the outfall location of the Libertad Channel just south of the proposed development were provided with additional source term (flow rate and concentration) to mathematically incorporate the pollutant loading in the model simulation.

In this study, two (2) predominant weather condition scenarios were investigated to predict the coastal currents and the transport and dispersion of pollutant plume near the reclamation location:

- ***Scenario A:*** Turbulent weather conditions with a strong south-westerly wind (habagat wind: speed of 5 $m \cdot s^{-1}$ and direction of 140 to 225 degrees) prevailing over the study area, representing the weather conditions during the rainy months.

- ***Scenario B:*** Summer weather conditions is represented with a strong north-easterly wind (amihan wind: speed of 5 $m \cdot s^{-1}$ and direction of 320 to 40 degrees) prevailing over the study area.

Periods of flood and ebb tides in the area were particularly described in the hydrodynamic characterization of the scenario simulations.

To compensate for the lack of detailed pollutant loading information to conduct a full blown water quality dispersal modelling, an alternative conservative tracer study is utilized to explicitly

investigate the transport and movement of pollutant tracer within the study domain. This method is like putting in a colored dye at a specific point and watches how it dilutes and changes its colour concentration as it moves with the flow. The transport of this tracer is computed in exactly the same way as the transport of any other conservative matter/constituent, such as oil, salinity, heat, and others. This approach is essentially valid for predicting the coverage and trajectory of pollutant plume in case of accidental spill of any conservative constituent within the project area.

In determining the amount of pollution loadings for consideration in the tracer study, a flow rate of about 10 m^3/s and tracer concentration of 1,000 mg/L were assumed in the absence of actual data. With this flow rate and assumed tracer concentration, the rate of tracer released at the Libertad Channel mouth is about 10.0 $kg \cdot s^{-1}$. The rather high discharge is considered to ensure that additional increase in flow velocities at the outfall is generated. This will then provide additional force for the tracer to move out to the coastal sea of which the dispersal can be better simulated. Also, the assumed high spill rate is considered an extreme scenario simulation of pollution dispersal in the area.

A steady-state model was used for running these scenarios. The rationale for the use of steady-state model, as opposed to dynamic model, was the lack of continuous hydrodynamic and meteorological data to perform complete dynamic simulation. For the final detailed area resolution model, direct rainfall, tributary discharge, evaporation rates and sediment mixing effects were not considered in the model simulation. The hydrodynamic model has several options for specifying the boundary conditions. For the detailed area model, open boundary conditions using the tidal levels and currents were defined in such a way that the water (and the effluent) can leave or enter the study area depending on current circulation. Moreover, the input boundary conditions of the nested model generated from the overall model are not constant in time and space but dynamically varying depending on the generated hydrodynamics at the specified boundary. Thus, the time and space varying water level and velocity boundary inputs provide the dynamic component to the steady-state model.

As mentioned earlier, a non-decaying tracer (constituent) simulation is a more conservative approach to investigating the fate and transport of matter from a specified source. Ignoring decay rates of constituents renders a more conservative way of modelling material transport, as the concentrations of constituents are not allowed to decrease in time and space by, for example, settling and deposition, radioactive decay, bacterial decomposition, or chemical reactions.

Results and Discussion

To quantitatively assess the coastal circulation and material transport conditions of the study area, the hydrodynamic model was simulated using the tidal conditions from January 5 to 15 2010 (coinciding with the available historical tidal data), with initial runs from January 1 to 5 to generate appropriate initial conditions of the model runs. The limited simulation period was due to the lack of long-term continuous observed tidal information over a wide range of varying physical conditions (wind patterns, rainfall events, river discharges, etc.) immediate to the project site to properly investigate temporally-varying forcing conditions. Scenario simulation analyses were nonetheless specified to cover representative atmospheric and hydrodynamic conditions of the study area.

Notwithstanding, the hydrodynamic model is able to replicate observed water level conditions within acceptable limits of accuracy (**Figure 2.2.22**). As shown, the result gives a good agreement between observed and computed water levels, although a slight underestimation is evident in the simulation. Considering the water levels are reproduced well by the model, the tidal ebbing and flooding as well as the advection transport in the area are assumed to replicate actual

conditions also in the analytical discussions of this study notwithstanding the given assumptions and limitations in modelling.

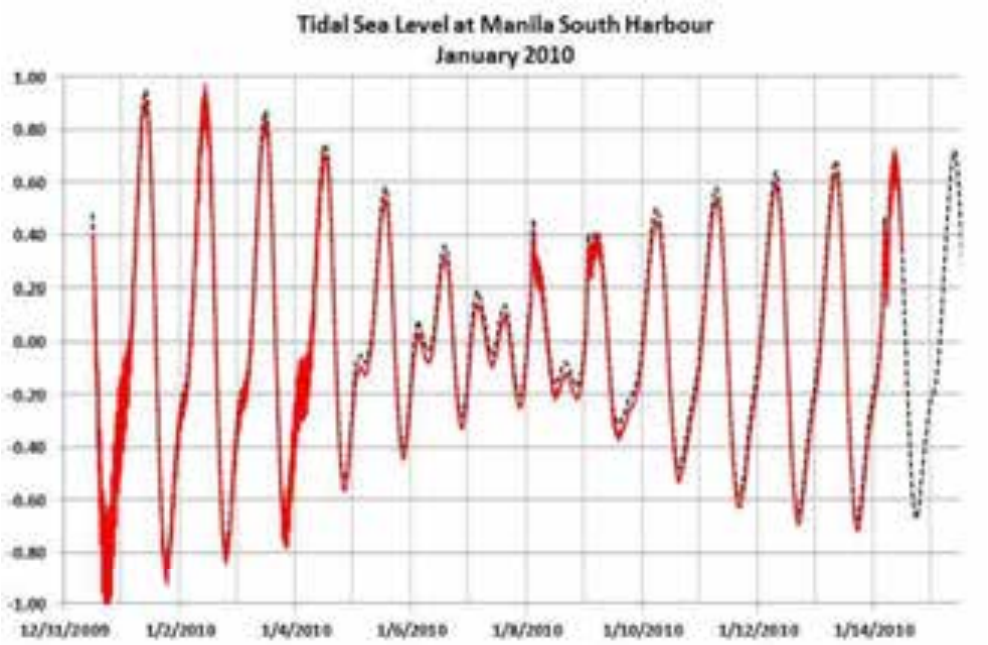


Figure 2.2.22 Comparison of observed and modeled tidal heights (m) (black and red lines, respectively)

Predicted currents in the Project's Coastal Area

While both winds and tidal forces significantly influence current circulation in coastal environments, currents were predominantly governed by tides in the Manila Bay domain, particularly in the project area. The results of the hydrodynamic simulation demonstrated tidal ebbing and flooding dictating current movement and mass transport within and out of the bay. This may have been brought by the complicated topography and coastal configuration of the project site.

Under amihan wind conditions scenario, with a wind velocity input of 5 $m \cdot s^{-1}$ and blowing from the northern direction, the model results revealed southward flow direction, with flow velocity fields in the range of 6 to 10 $cm \cdot s^{-1}$ near the coastline.

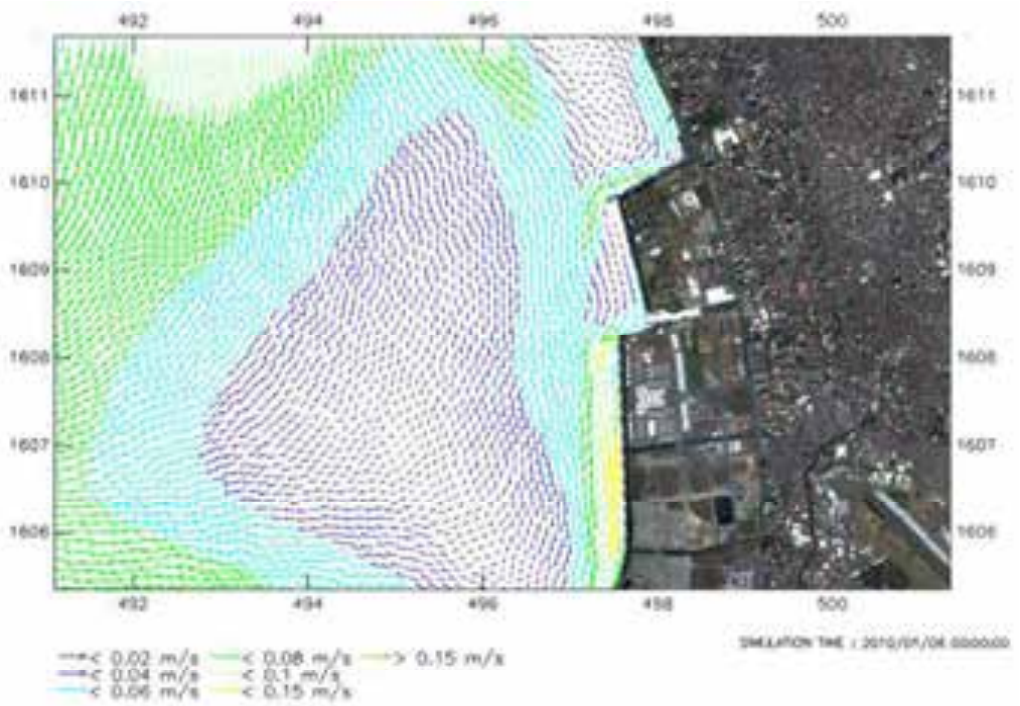


Figure 2.2.23 Predicted flow velocity field under Amihan wind condition

Using wind velocity input of 5 $m \cdot s^{-1}$ blowing from the southern direction for habagat wind condition scenario, the model results revealed more or less similar flow magnitudes when compared to the amihan wind scenario. The model runs revealed that from the open sea, a predominant flow direction is from the west and upon reaching shallow areas near the shore turns towards the northern direction following the configuration of the coast. Flow velocity fields in the range of 4 to 15 $cm \cdot s^{-1}$ are likewise predicted by the model.

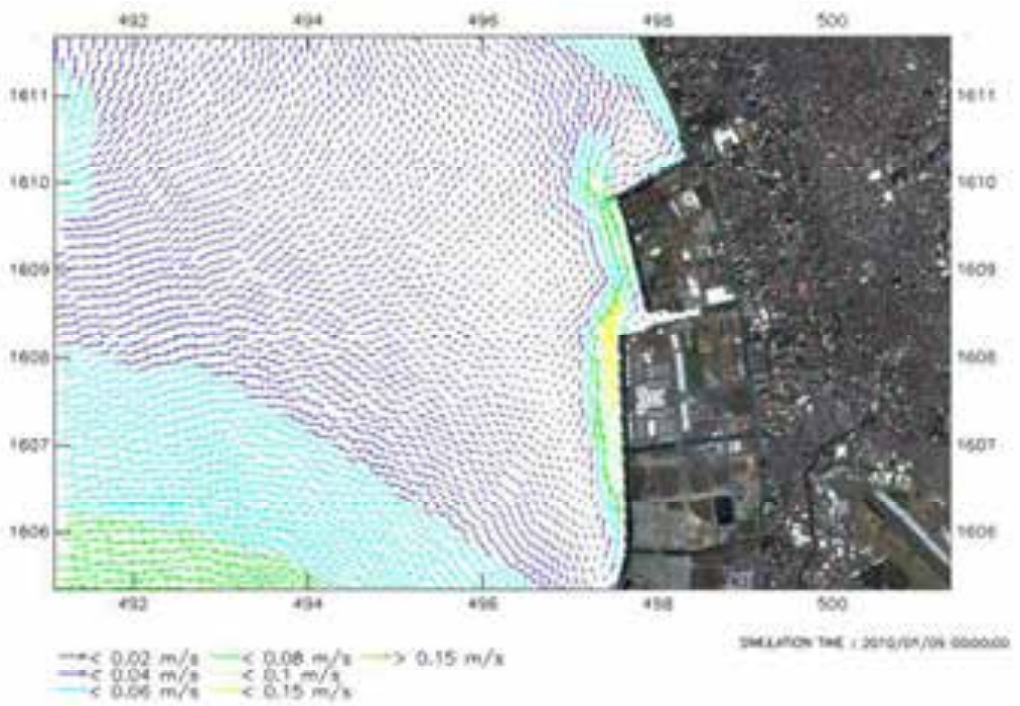


Figure 2.2.24 Predicted flow velocity field under windy condition (habagat)

Impact of the Proposed Reclamation Development on Pollutant Dispersion at the Coastal Vicinity of the Project

This section assesses the movement and dispersal patterns in the study area using conservative tracer modelling, as a function of the general hydrodynamics around the development site. As it is expected that the reclamation will not increase the pollution loads coming from the upstream sources, the changes to the water quality in the lagoon are assessed by determining the change in water quality through a tracer analysis. In particular, dispersal, dilution and accumulation patterns of the tracer as transported by the ambient current circulations were investigated to give a very good indicator for potential impacts arising from the proposed reclamation on overall water quality.

It is assumed that the ambient tracer concentration of the model domain coastal zone is zero. This is to specifically ensure that tracer concentrations as predicted by the model are attributed exclusively from the source. Scenarios were developed to incorporate the effects of southwesterly and northeasterly winds to investigate the propagation and dispersal of the tracer plume as current is forced by the wind, particularly near the surface.

Tracer discharges were simulated operating continuously for at least 10 days in the model, to allow build up of the far field tracer plume over many tidal cycles. Results were examined over a spring cycle using tidal data from January 2010.

The results of the model runs are shown in the next succeeding figures. Some of the results of the 10-day simulation of tracer plume incorporating the effects of surface winds, and the rise and fall of tides are presented. Therefore, the snapshots cover most of the interesting patterns that may be expected during flooding and ebbing and also during slack water.

Scenario A – Tracer Dispersion under a South-westerly Wind Condition (Habagat wind)

This scenario setting incorporated the influence of wind on coastal current circulation and conservative tracer transport and movement in the study area. This was accomplished with the use of a uniform wind speed forcing of 5 $m \cdot s^{-1}$ (habagat wind, 140 to 225 degrees from the north), representative of the southwest monsoon conditions.

To determine the impact of the 60-hectare reclamation development, the coastal model was developed for the 'with' and 'without' (pre-development or baseline condition) reclamation scenarios. By making sure that all inputs in the model setup remain the same for 'with' and 'without' scenarios, any changes in the amount and trajectory of the tracer plume can then be attributed to the changes in the geometric configuration of the coast.

The next two figures show the tracer plume as it enters the main coastal sea from the mouth of the Libertad Channel, one hour after its initial release. In the first figure, representing the 'without' project scenario, the tracer plume reaches just the edge of the reclaimed land south of the proposed reclamation.

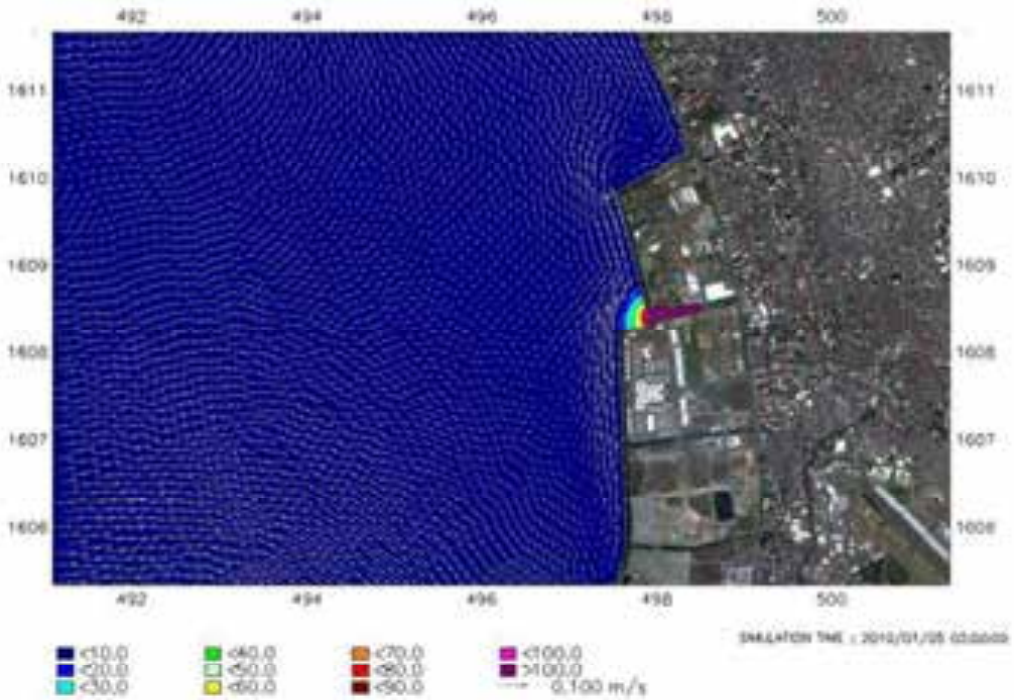


Figure 2.2.25 Predicted tracer plume one hour after its initial release, without the project and under habagat wind condition

The second figure represents the 'with' project scenario and has the same model inputs as the first one except the presence of the reclaimed land (which were treated as permanently dry during the computational process). As shown, aside from the outward dispersion similar to that predicted in the 'without' scenario, the tracer dispersed along the artificial channel separating the main land with the proposed reclaimed land. One hour after initial release, the tracer plume reaches up to the middle of this artificial channel with concentration less than 10 mg/L at the tracer plume's front.

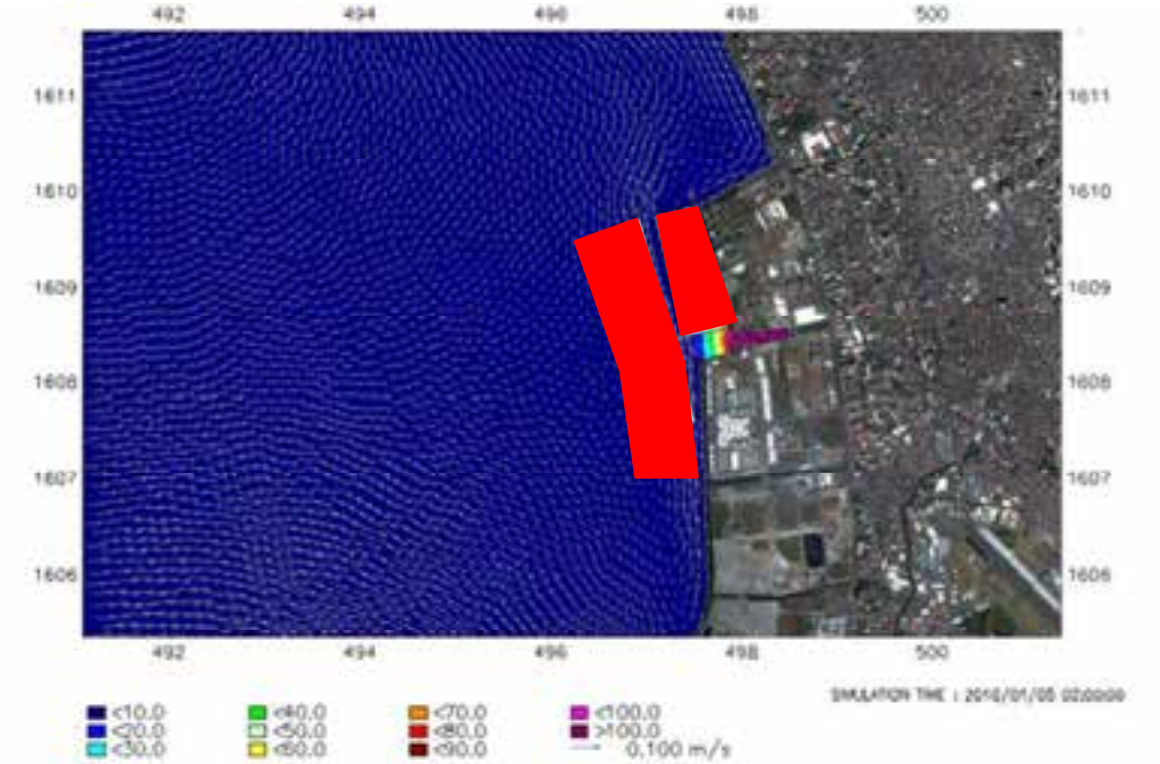


Figure 2.2.26 Predicted tracer plume one hour after its initial release, with the proposed reclamation project in place (shown as white area) and under habagat wind forcing condition

The next two figures show the extent of mixing and transport of the tracer plume after 12 hours of continuous release from the Libertad Channel outlet, under the scenarios 'without and 'with' reclamation project. Without the project, the tracer plume reaches farther north and extending up to the breakwater located at the coastal vicinity of Gloria Maris head office, with concentrations less than 20 mg/L. Also notice the path of the tracer plume following the general direction of the flow; and in this case towards the northerly direction.

With the proposed reclamation, the model predicts quite different tracer distribution. After 12 simulation hours and with the inclusion of reclaimed land and the channel separating the two land masses, the model predicts the tracer plume extending up to the opposite side of the breakwater and in the docking area of Prestige Cruises. Due to the 'sheltering' effect of the proposed reclamation, low flow velocities are predicted at its inner side, the consequence of which is a weak mixing and transport, which then lead to rather high concentration of the tracer in these areas. As shown, without the project, the tracer plume with more than 100 mg/L concentration affects only up to a few meters from the channel mouth whereas with the proposed project in place, the area with more than 100 mg/L affects the whole stretch of the artificial channel as well as the larger area from the Libertad Channel mouth.

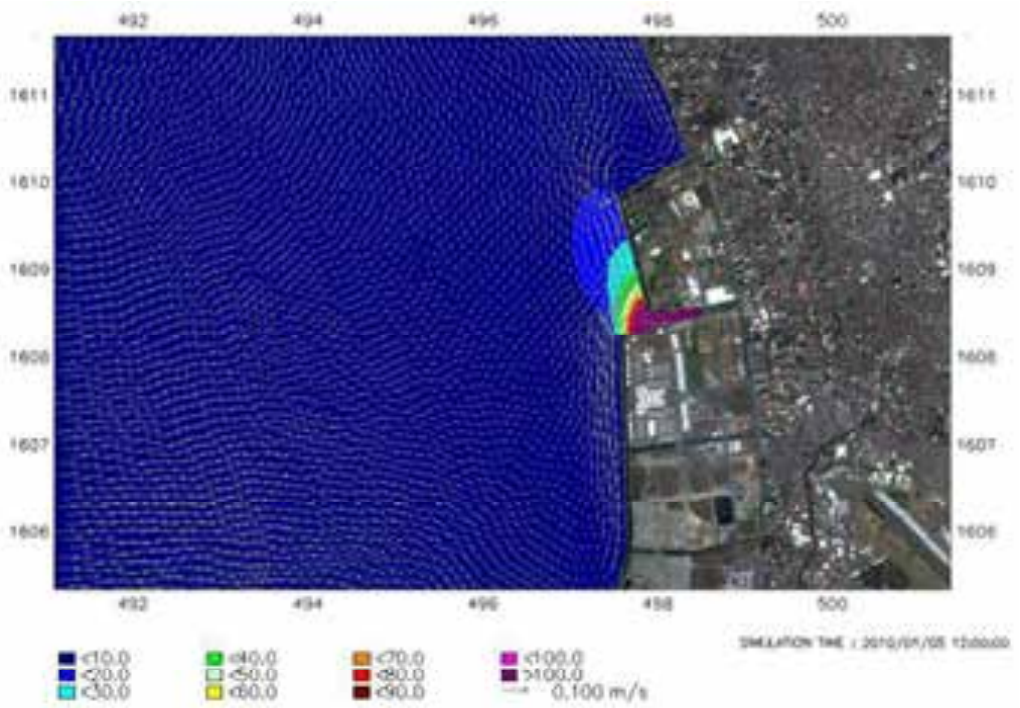


Figure 2.2.27 Extent of predicted tracer plume without the project, after twelve (12) hours of continuous release

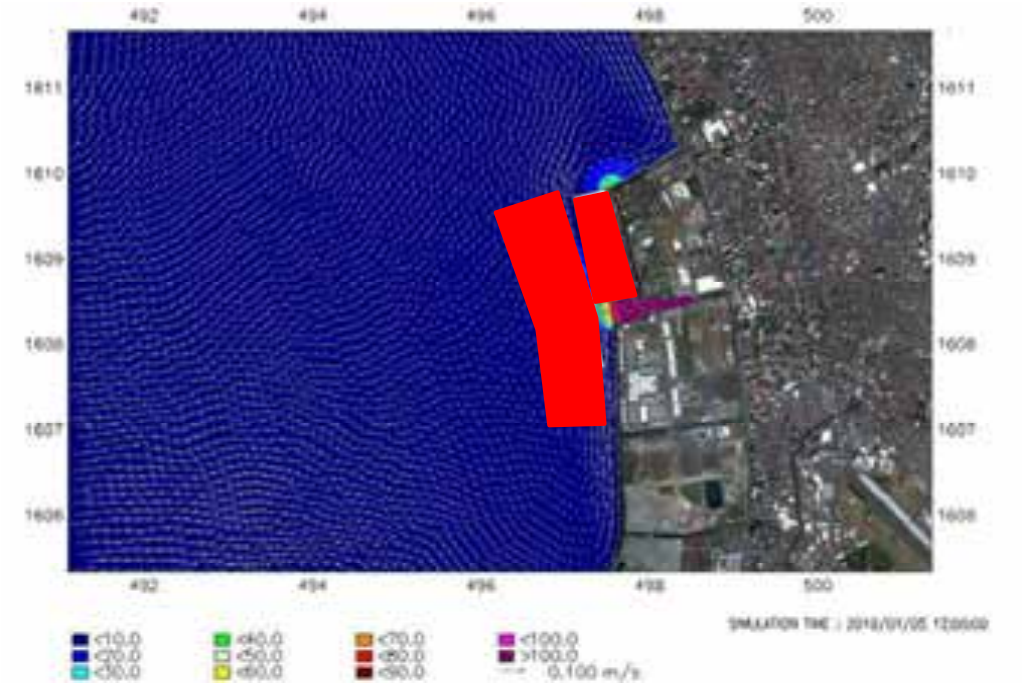


Figure 2.2.28 Extent of predicted tracer plume with the reclamation project, after twelve (12) hours of continuous release

The next three figures show the progression of the plume after 3 days, 5 days and 10 days, respectively, of continuous release of tracer at the mouth of Libertad Channel without the reclamation project in place. The high levels of tracer remain near the vicinity of the channel mouth, with only lesser concentrations moving farther away from the source. As mentioned earlier, the input tracer concentration at the source is 1,000 mg/L and though in the figure it seems it affects quite a large area, the concentration of the tracer, as predicted by the model, is only about 2 percent (less than 20 mg/L) of the original concentrations at the far end of the dispersed plume.

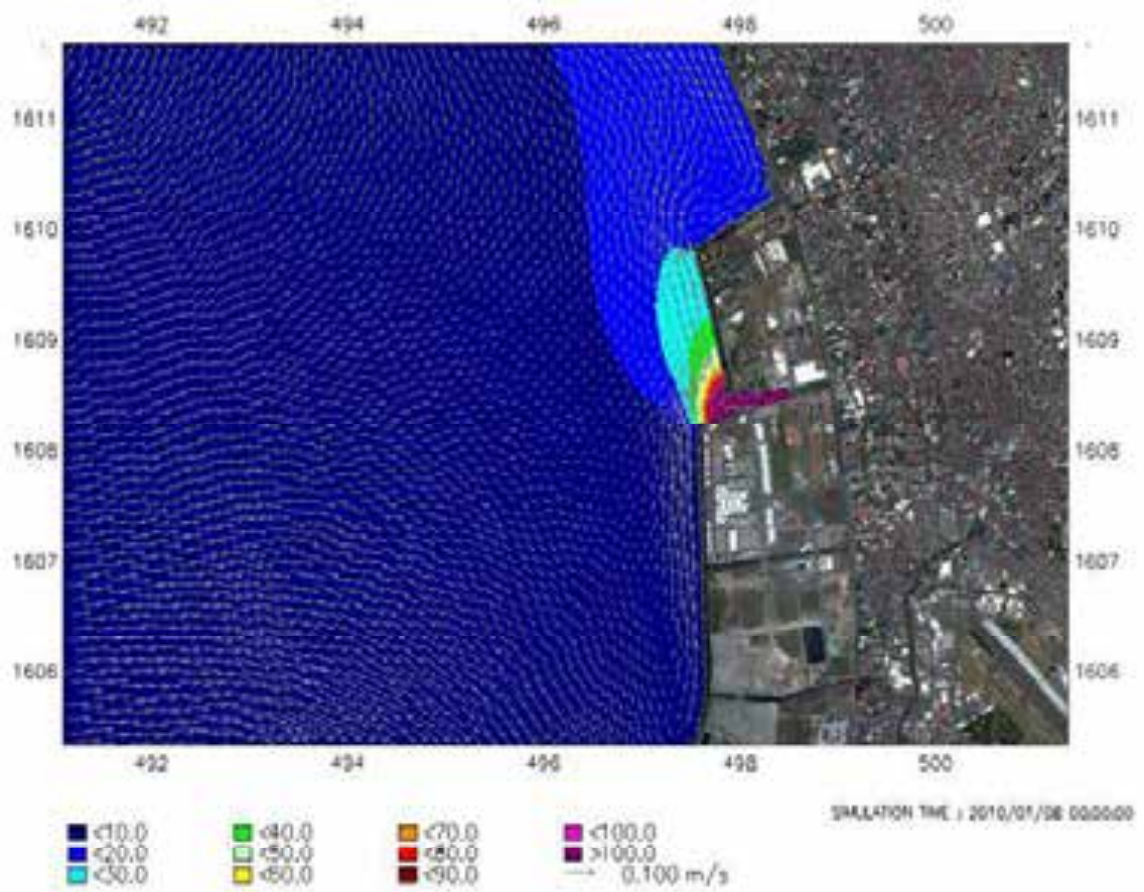


Figure 2.2.29 Extent of predicted tracer plume after three (3) days of continuous release, without the project

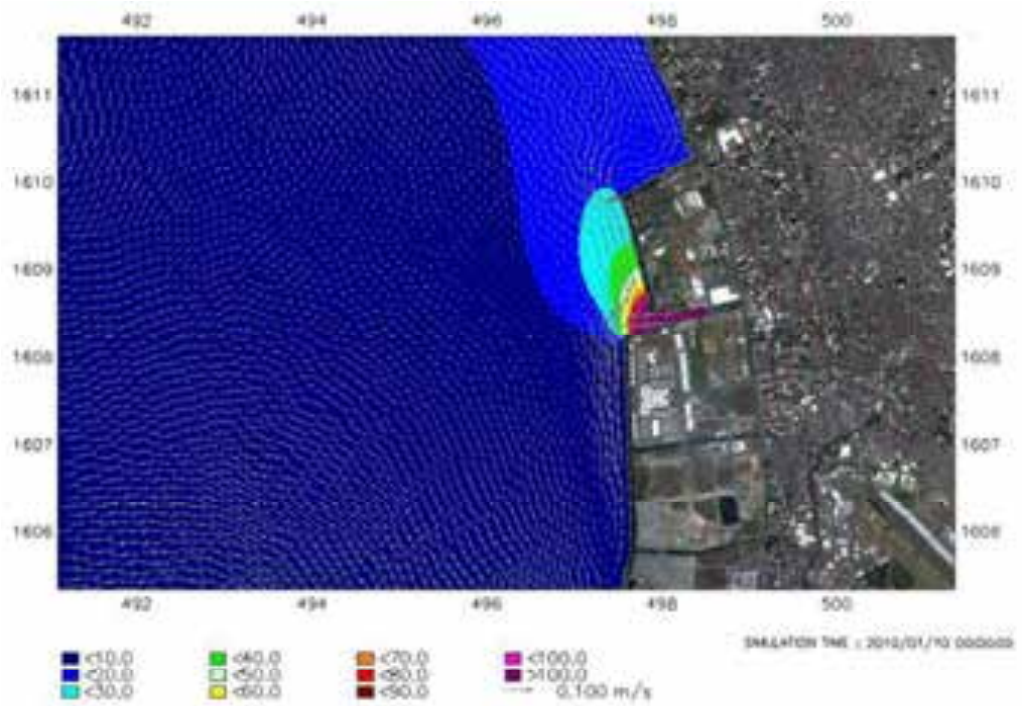


Figure 2.2.30 Extent of predicted tracer plume after five (5) days of continuous release, without the project

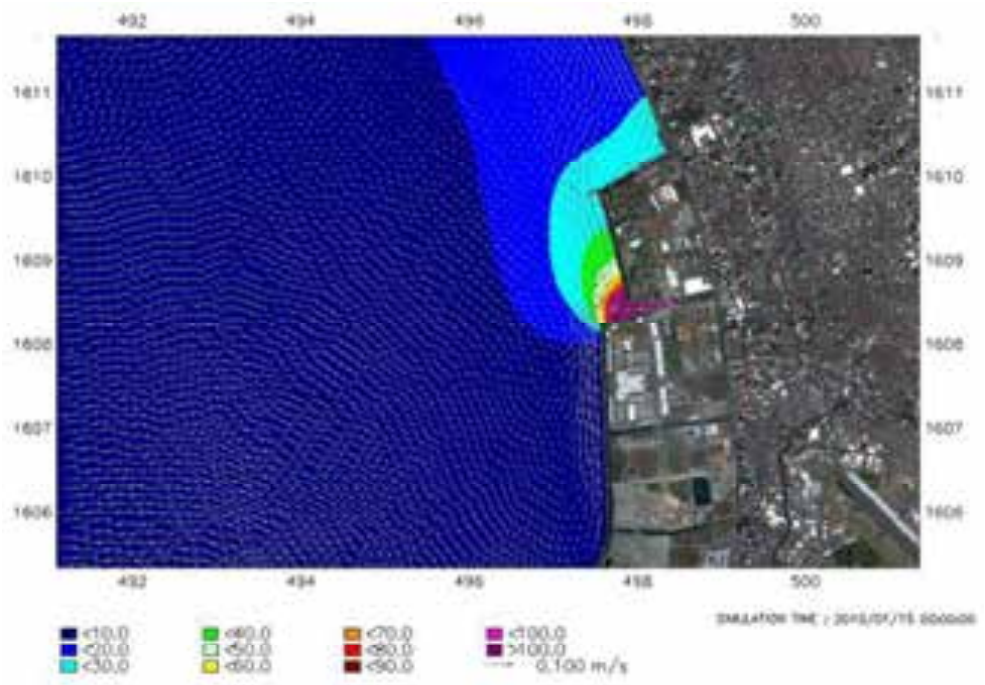


Figure 2.2.31 Extent of predicted tracer plume after ten (10) days of continuous release, without the project

To visualize and compare the impacts of the proposed reclamation, the following figures show the general trajectory of the tracer plume using the same habagat wind conditions. As shown, the extent of the plumes are almost the same for the three periods presented (i.e., 3 days, 5 days and 10 days) which means that it reached its equilibrium state after a few days. The presence of articificial channel between the reclaimed land and the present coast serve as a conduit to transport part of the tracer on the upper part of the coast thereby making the tracer concentrations in that area higher than when there is no reclamation, though the change in concentration is not that high.

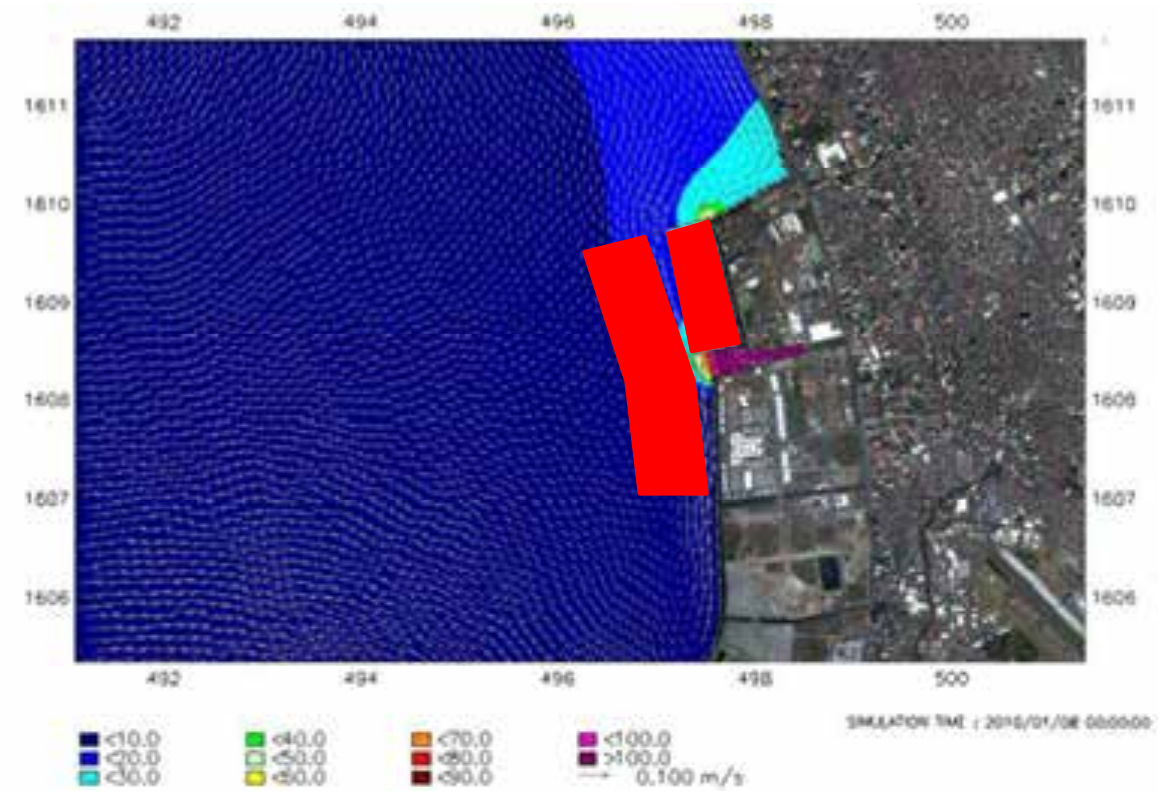


Figure 2.2.32 Extent of predicted tracer plume after three (3) days of continuous release, with the proposed reclamation project

Also note that high concentrations of more than 100 mg/L remains and is mainly situated at the channel mouth, and at the spaces between the mainland and of the proposed reclaimed land. This is mainly due to poor mixing due to limited influence of the wind and wave actions in these confined areas. Once the plume enters the open area where flows are quite high, the model simulates higher dissipation rates. Nonetheless, the area covered by the plume where lesser concentrations are in the range of less than 10 mg/L remain more or less the same, with or without the reclamation project in place.

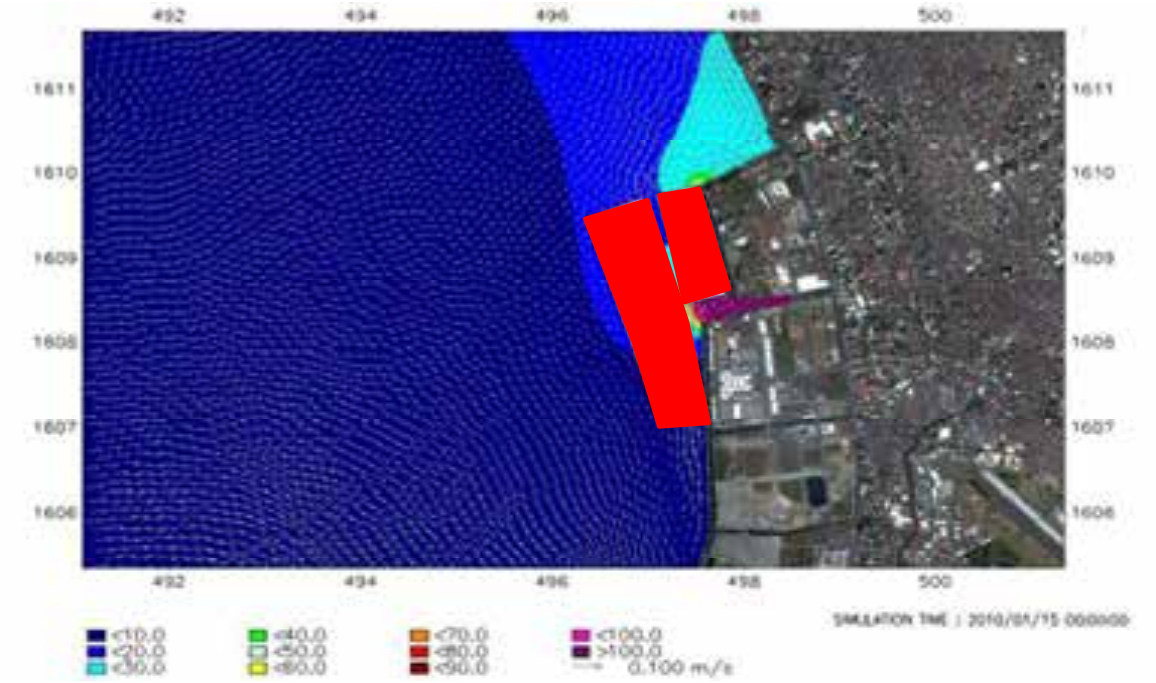


Figure 2.2.33 Extent of predicted tracer plume after five (5) days of continuous release, with the proposed reclamation project

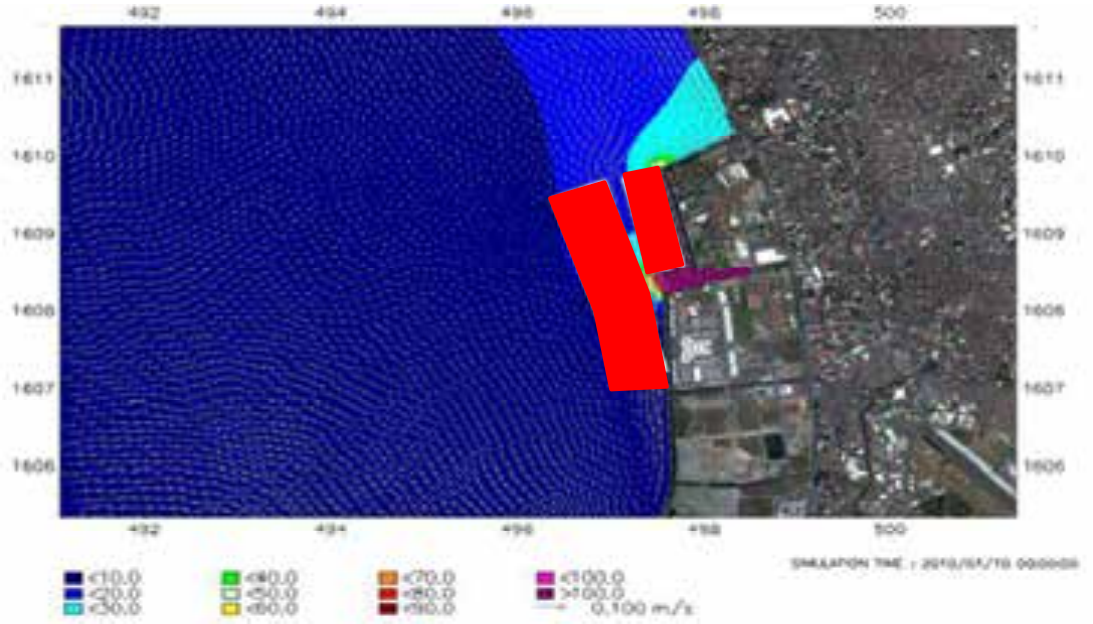


Figure 2.2.34 Extent of predicted tracer plume after ten (10) days of continuous release, with the proposed reclamation project

The next figure shows the changes in tracer concentrations with and without the reclamation project. By taking the difference in the results of the predicted tracer plume maps for 'with and 'without' the reclamation project scenarios, the decrease and increase in concentrations that could be attributed to the impact of such reclamation can be generated and mapped out.

From the resulting map, it appears that during habagat event, the reclamation would only affect the area in vicinity of Libertad Channel mouth, the whole stretch of the artificial channel and the coastal area northeast of the said artificial channel. Beyond these area and farther out to the sea, the increase in concentration is deemed insignificant, as shown in the area covered by the <1 mg/L contour in the figure.

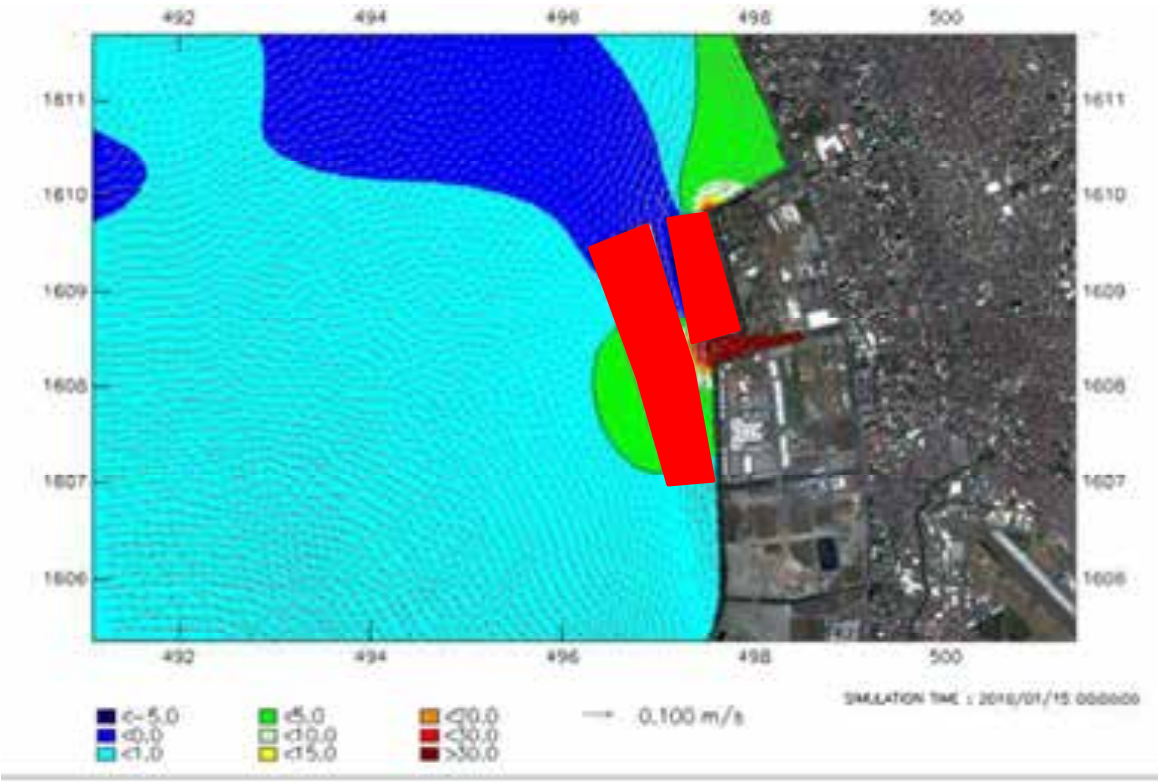


Figure 2.2.35 Changes in the predicted tracer concentration, after ten (10) days of continuous release (areas with increase of more than 5 mg/L is shown with black contour)

Scenario B – Tracer Dispersion under a North-easterly Wind Condition (Amihan wind)

The next scenario sets describe the impact of the 60-hectare reclamation on the fate and transport of water quality pollutant (represented by a tracer) considering the prevailing amihan wind condition in the project area. To save on report space, the model results presented in this section are based on a continuous 10-day release of tracer load at the mouth of the Libertad Channel located south of the project area.

B.1. Without the Project

Generally, amihan wind prevented the plume to freely move towards the open sea at the western side and forces it to move southward of the project area and moving along the coastline. After two days of constant tracer discharge, the plume reaches more than a kilometer away from the source. Similar to habagat wind condition, high concentrations are confined mainly at the mouth of the channel and rapidly disperses and diluted as it moves away from the source.

After ten days of constant tracer discharge, the area affected with more than 30 mg/L tracer concentrations remain more or less the same, with marginal increase in areal coverage affected by the less than 20 mg/L concentration.

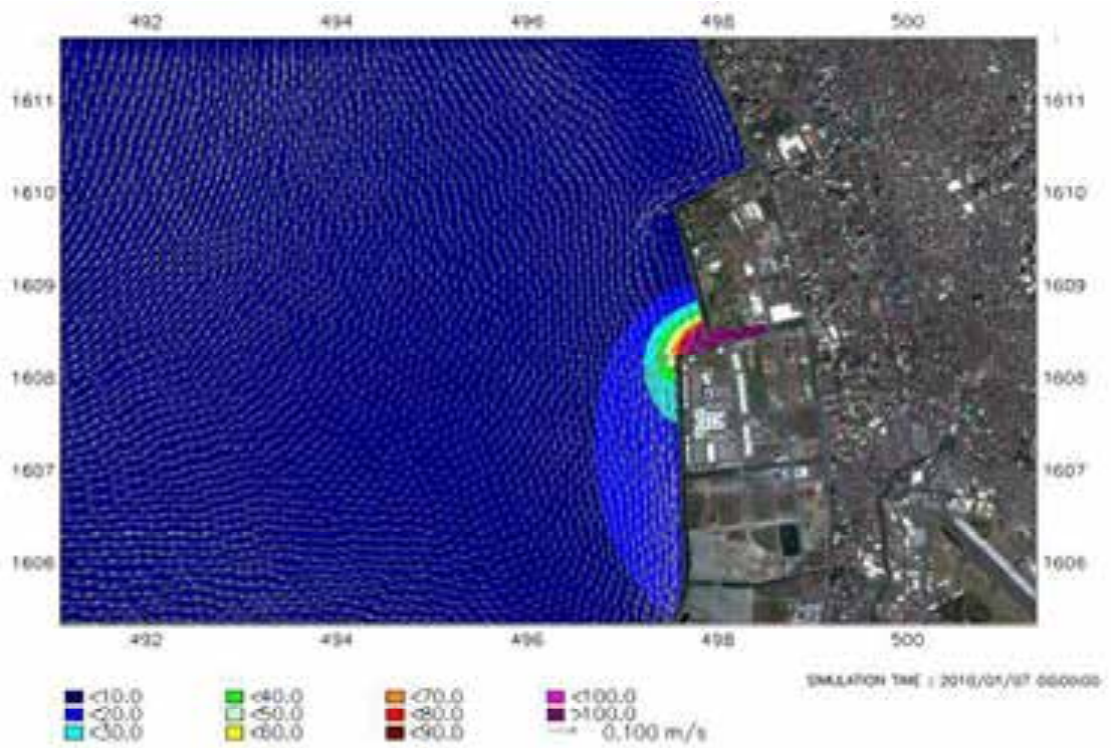


Figure 2.2.36 Extent of predicted tracer plume after two (2) days of continuous release, without the project

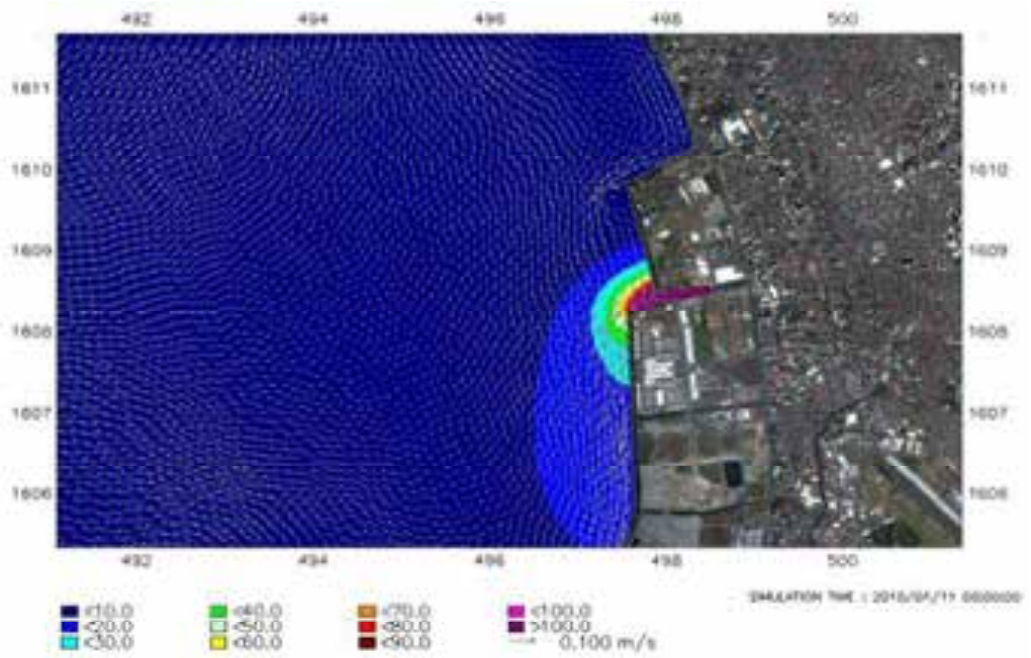


Figure 2.2.37 Extent of predicted tracer plume after six (6) days of continuous release, without the project

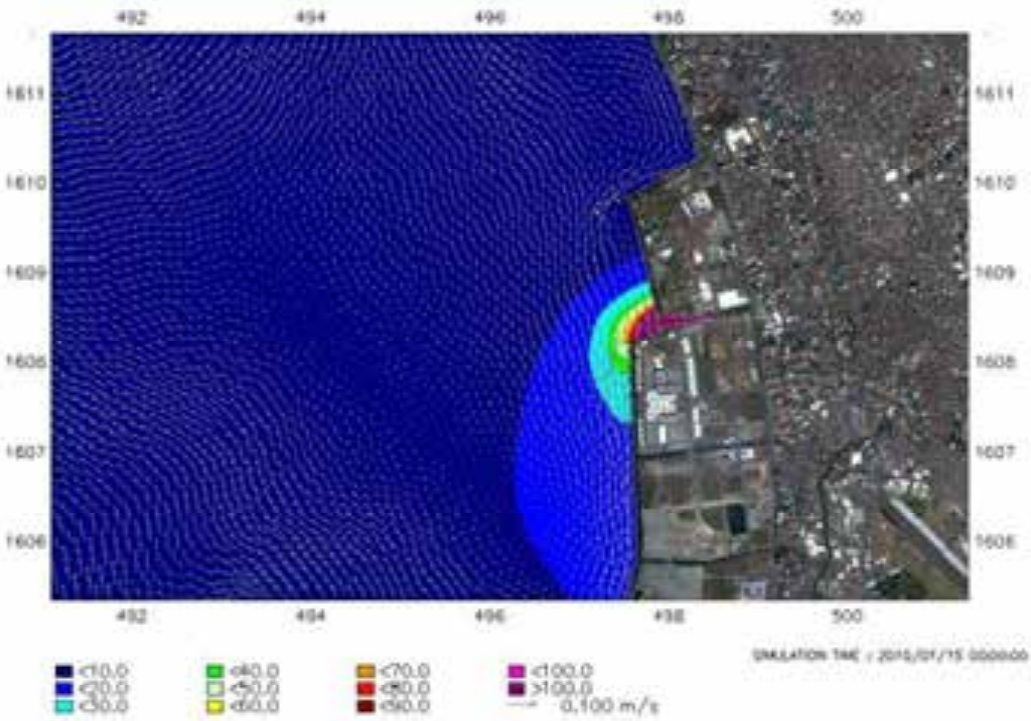


Figure 2.2.38 Extent of predicted tracer plume after ten (10) days of continuous release, without the project

B.2 With the Proposed Reclamation Project

The presence of reclamation area in the model and its impact on the pollutant transport (and prevailing flows) were also investigated under amihan wind conditions.

Based on the model results, there is no appreciable difference in the transport of the tracer plume with or without the project. Similar to the 'without' project scenario, lower concentrations of the plume (as shown by the <20 mg/L) extends to a larger area while high level concentrations are mainly confined at the channel mouth and the artificial channel, see the three figures representing the progression of the plume 2 days, 6 days and 10 days of continuous tracer releases at the Libertad Channel.

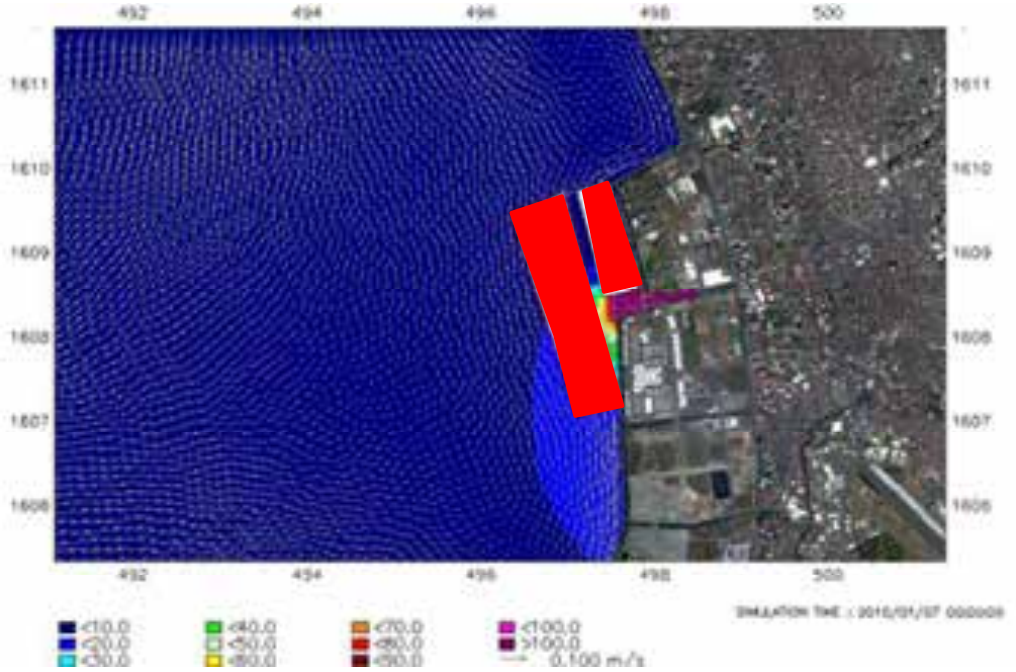


Figure 2.2.39 Extent of predicted tracer plume after two (2) days of continuous release, with the proposed project in place

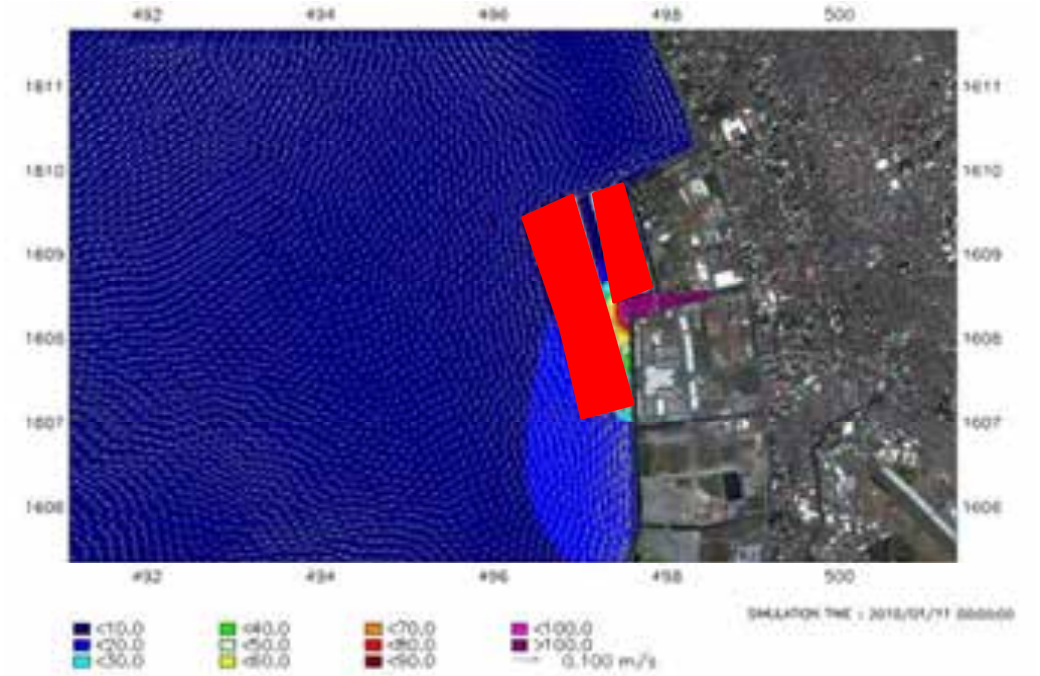


Figure 2.2.40 Extent of predicted tracer plume after six (6) days of continuous release, with the proposed project in place

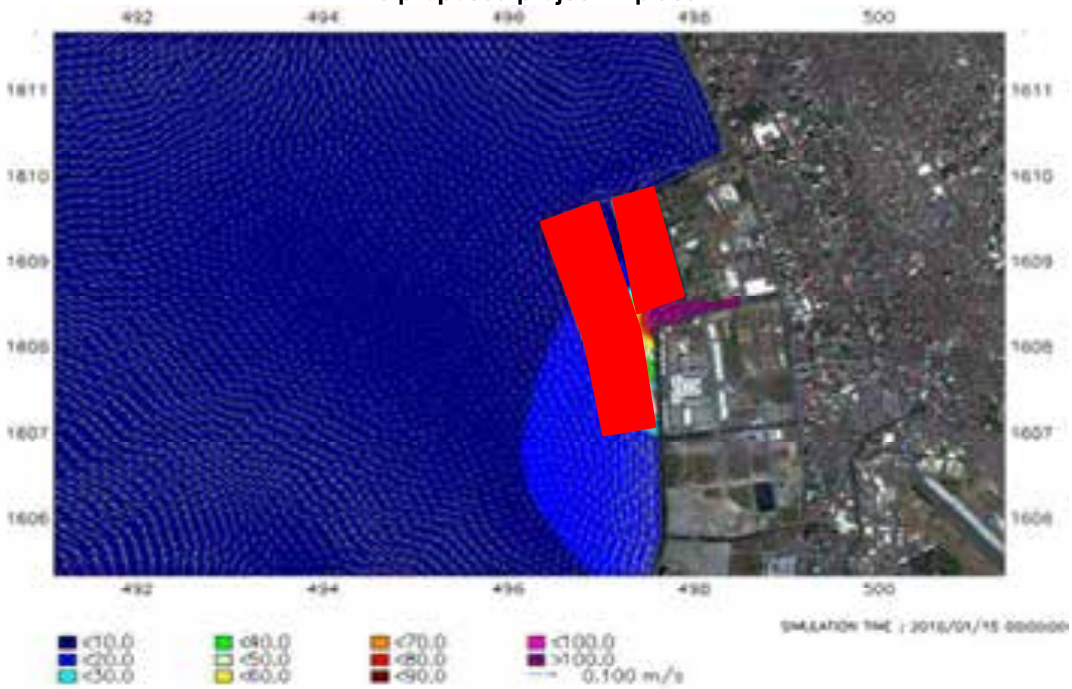


Figure 2.2.41 Extent of predicted tracer plume after ten (10) days of continuous release, with the proposed project in place

Wave Simulations

To obtain representative estimates of wave characteristics in the project area, use was made of the wave model SWAN (Simulating Waves Nearshore), a freely-available, open source computer model that computes random, short-crested wind-generated waves in coastal regions and inland waters from given wind, bottom and current conditions.

Using the same computational grid of the flow model, the wave parameters for the open boundaries were set with assumed significant wave height of 2 m, a wave period of 10 seconds and a wave direction of 250 degrees. The wave patterns were simulated for extreme wind conditions representing a storm event with an assumed constant wind magnitude of 42 $m{\cdot}s^{-1}$ (about 150 kph) blowing from the west. These inputs were used for both with and without the project scenarios.

Results of the wave simulation for 'without' the project show that wave refraction or bending occurs at the northeast of the coast as well as the mouth of Libertad channel due to the coastline configuration. During habagat (southwest monsoon) conditions, waves predominantly come from the west and slightly refract or bend toward the coast upon reaching the shallow part of the sea. Due to the rather deep coasts near the project area, wave refraction will be slightly weaker. Waves approaching this portion of the coast at an angle will not be refracted enough to change the approach angle perpendicular to the coast.
The presence of the reclamation project in the area does not significantly alter the wave direction, as shown in the two **Figures 2.2.42**. However, significant wave heights of more than 5 meters during storm events predicted at the areas just north of the said reclamation works would be reduced, which would mean that the reclamation area serves some sort of a breakwater from incoming waves and thus 'shelter' the said area especially during catastrophic storm surge event. Essentially, reclamation increases the protrusion of landmass into the coast and naturally increases the sheltering effect at the leeward side of the protrusion.

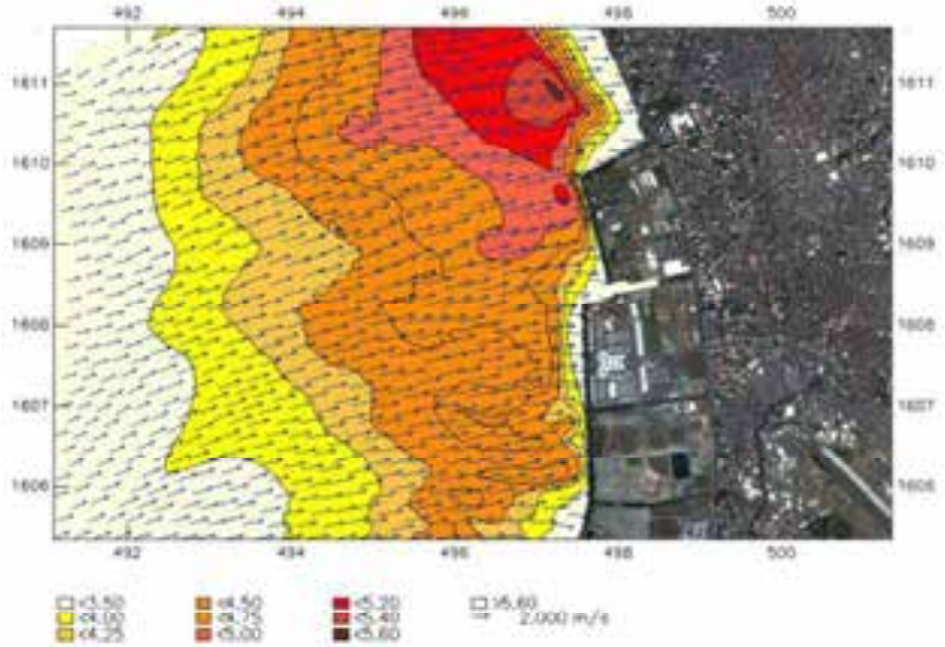


Figure 2.2.42. Predicted wave direction (shown as arrows) and significant wave heights (shown as contours, in meters) during storm event for the existing coastal configuration

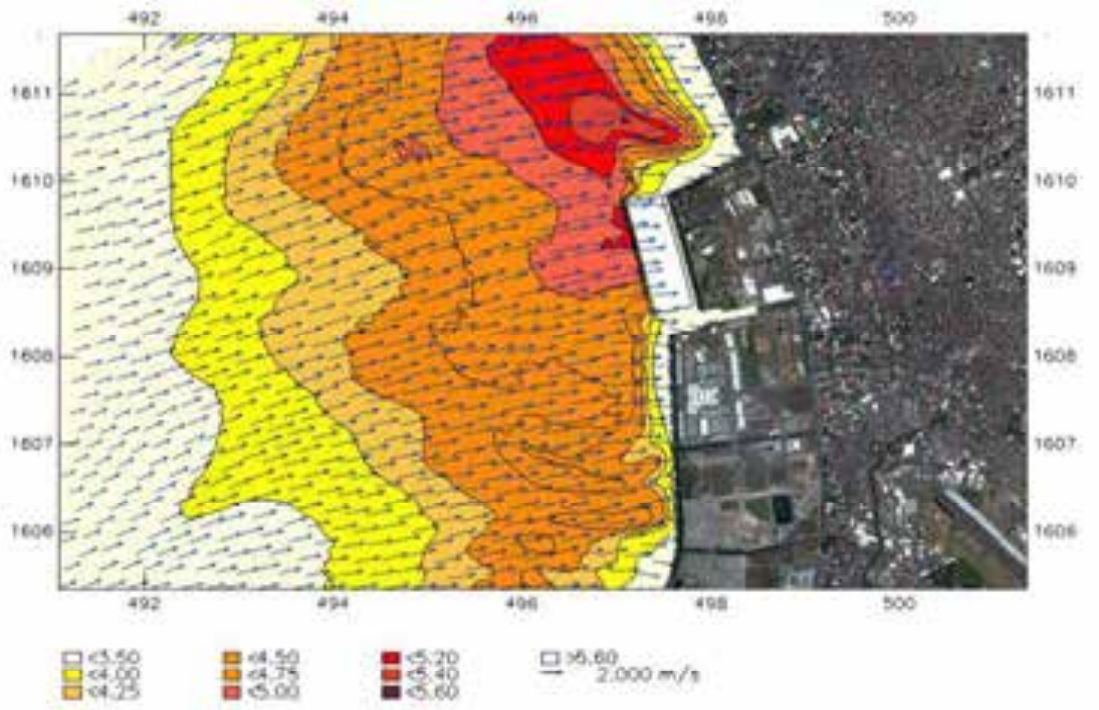


Figure 2.2.43 Predicted wave direction (shown as arrows) and significant wave heights (shown as contours, in meters) during storm event, with the proposed reclamation project

Discussions and Concluding Remarks

The numerical modeling study investigated the circulation and transport features of the portion of Manila Bay coastal environments with scenario analysis on the possible impacts of the proposed 60-ha reclamation project within the territorial coverage of Pasay City. The numerical modeling exercise included key components and assumptions, for example, the actual hydrodynamic processes were represented by the model theoretical equations; barotropic and baroclinic pressure gradients were disregarded in the model set-up (river discharges, evaporation and direct rainfall were not incorporated); uniform wind field condition, etc. It is encouraging to note that despite these assumptions, the model calibration result gives a very good agreement in terms of observed and computed water level time series and is therefore acceptable.

The water quality in coastal areas is very closely linked to water exchange and the local loads of pollutants and nutrients. To assess changes in the water quality in the proposed reclamation area, a tracer study through modelling was conducted. Though this does not account for actual distribution in specific pollution loads, nor the actual bio-chemical processes, this approach provides an indication of the transport/flushing regime in the system, and thus a very good indicator for potential impacts arising from, say, pollutants discharged from tributaries on overall water quality. The tracer study can be analogous to placing a colored dye in a certain point and observe the dilution of the dye, where it is transported and at what concentration. This provided a generic assessment of how conditions in the area, e.g., salinity, nutrients and contaminants are exchanged according to the hydrodynamic conditions.

Post-processing of the model results were conducted to derive the maximum tracer concentration computed for each grid cell for the whole simulation period and to consolidate the results for two

wind scenarios, habagat and amihan. The results were then mapped to visualize the extent of the plume, for 'without' and 'with' proposed project, as shown **Figure 2.2.44**.

From these maps, it can be deduced that the transport and fate of the pollutant (represented by the tracer) would remain more or less the same if the reclamation project pushes through. Only areas northeast and south of the proposed reclamation works are affected by the marginal increase in tracer concentration.

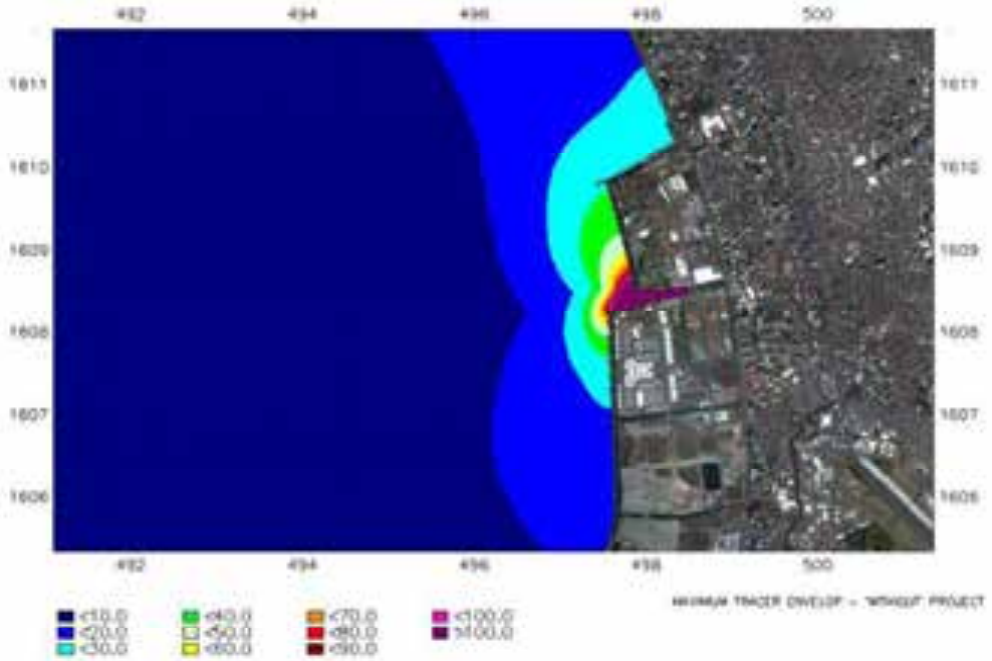


Figure 2.2.44 Predicted maximum tracer concentrations consolidating the habagat and amihan wind scenario results, without the project

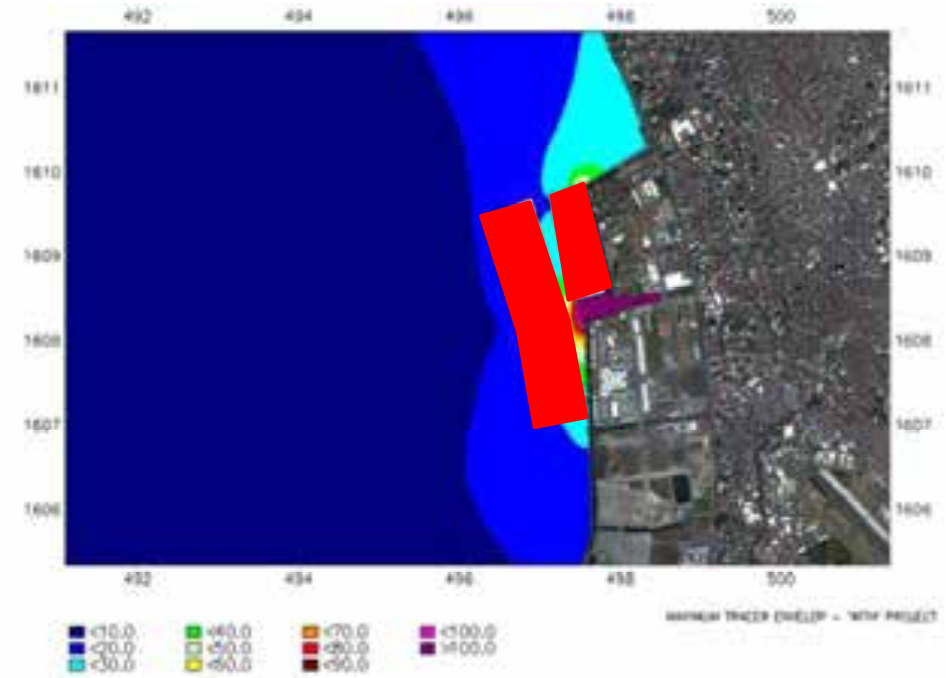


Figure 2.2.45 Predicted maximum tracer concentrations consolidating the habagat and amihan wind scenario results, with the reclamation project in place

Using the mapped maximum tracer concentrations for 'with' and 'without' project, the potential changes in the dispersion patterns in the coastal area as a result of this proposed reclamation project were derived by taking the difference of these two maps, as shown **Figure 2.2.46**. As indicated in the map legend, the coloured area in the figure represents increased tracer concentrations – for example, yellow areas represent less than 3 mg/L increase in tracer concentration with the reclamation project in place.

The highest levels of tracer occur around the channels, due to the low flow velocities in these areas, though once it enters the open sea, the tracer rapidly diluted due to prevailing surface currents. The white line in the figure delineates areas with concentrations greater than 5 mg/L concentration, of which the area covered is about 130 hectares. Hence, these confined channel areas should be given appropriate attention during reclamation works to ensure that it has sufficient depth and should be periodically dredge to increase the flushing and transport mechanisms with the open sea.

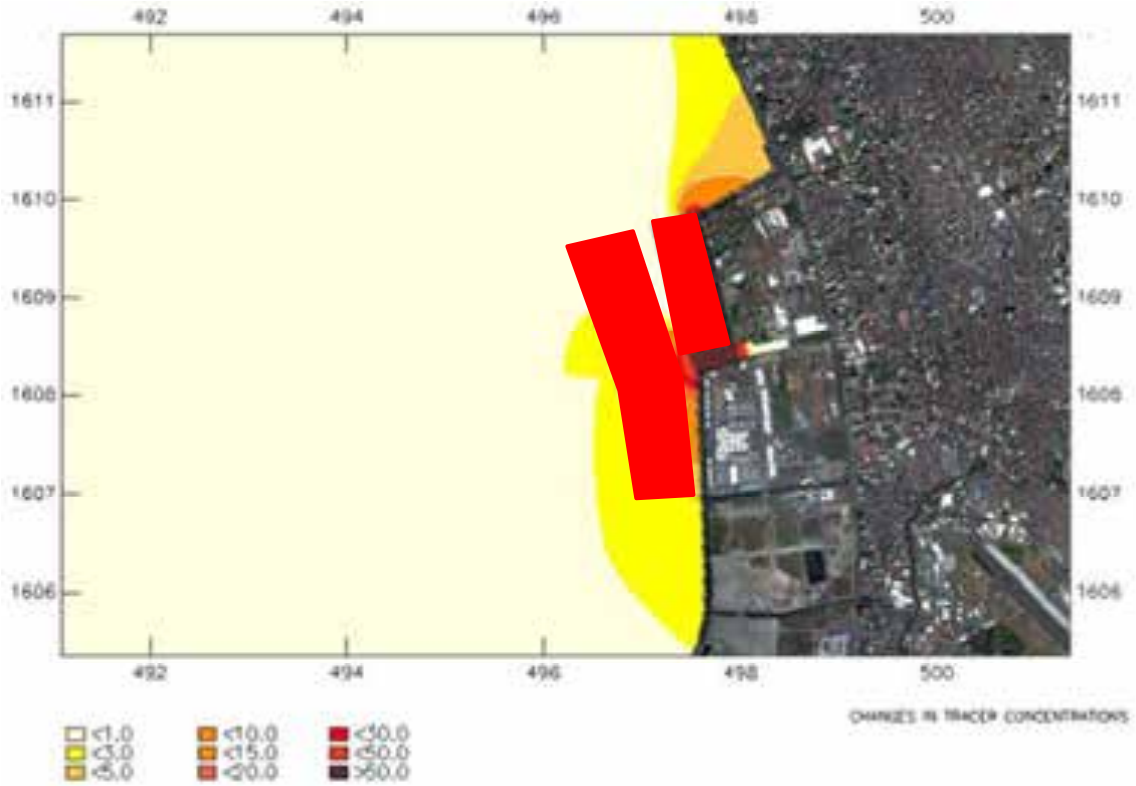


Figure 2.2.46 Predicted changes in tracer concentrations as a result of the reclamation project

In summary, from the tracer modeling study, results revealed that the project area has an effective mixing mechanism to dilute the pollutants. This could mean that the area is capable of minimizing potential impacts arising from say, accidental spill of pollutants from upstream sources and that the proposed reclamation project does not significantly affect the water movement and transport patterns and hence there is no predicted significant impact on the water quality of the immediate coastal area.

Also, one of the positive impacts of the said reclamation project is that it increases the sheltering effect at the leeward side of the reclaimed land. Based on wave analysis conducted, wave heights at the northeast side of the reclamation were found to decrease during the habagat wind simulation, and therefore, can minimize potential impacts of say, a storm surge hitting this area.

The following secondary measures are recommended to further improve the water quality conditions at the project area:

- Periodic maintenance dredging/desilting of existing creeks and channels draining in the area, as well as the proposed channel separating the reclaimed land to ensure effective transport of upstream runoff;
- During reclamation works, in case of accidental spill of spoiled materials, silt screens and or other similar measures must be ready to contain the affected area and improve water quality;
- Continue monitoring of water quality in the area to determine baseline conditions and provide data for environmental improvement;
- Environmental monitoring and management program before and during reclamation works;

- Work with LGU and other concerned entities to ensure that coastal management, waste management, rehabilitation programs, among others, are implemented to maintain the overall environmental quality of the area.

Cumulative Impacts of the Manila Goldcoast and Pasay City Reclamation Projects

The possible changes in coastal flow velocities due to the combined effects of the two proposed reclamation project: the Manila Goldcoast Reclamation Project and the 360-Hectare Reclamation Project in Pasay City were quantified using a two-dimensional hydrodynamic model which were set-up for the study area.

These proposed reclamation projects are incorporated into the model domain by designating grid cells within the planned reclamation sites inactive (permanently dry) during the model computation. The grey area in the next succeeding figures represents the coverage of these reclamation projects. With all model inputs made similar to both 'with' and 'without' project hydrodynamic scenarios, changes in the predicted flow velocities can be appropriately attributed to the impacts of these reclamation projects in the study area.

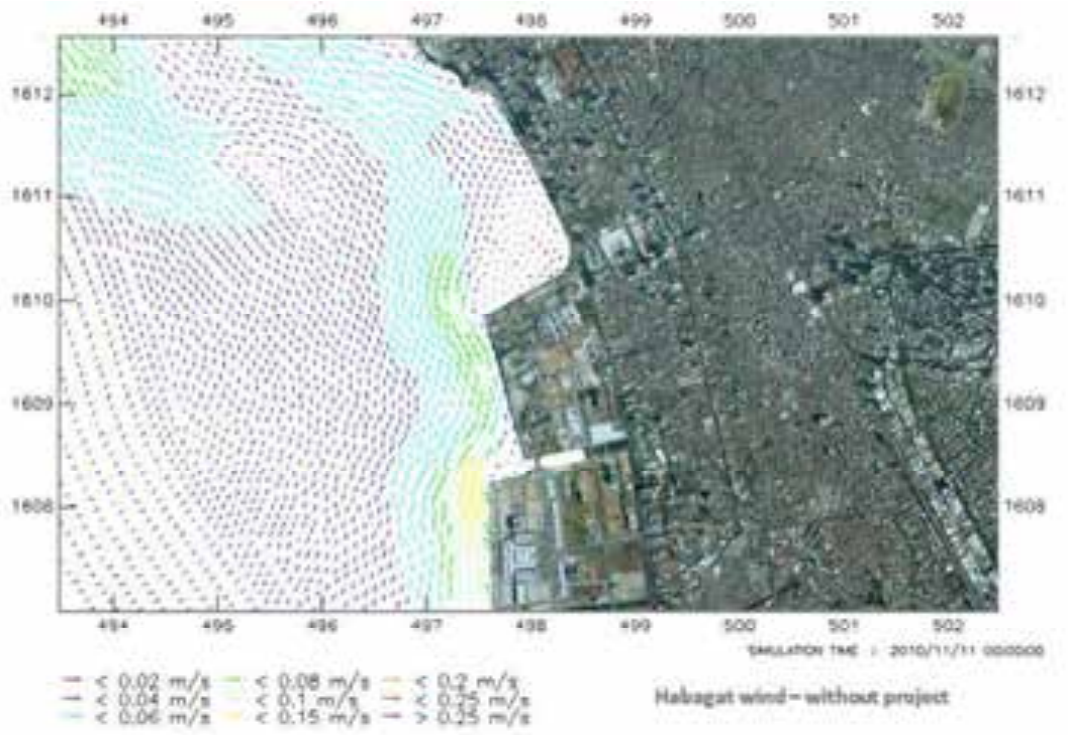


Figure 2.2.47 Predicted currents in Manila Bay's project area without the planned reclamation (habagat wind)

The next figure shows the flow velocity field with the two reclamation projects in place. During habagat event, the protrusion of the largest reclamation island re-directs the otherwise northward currents. The model predicts that the currents, upon reaching the western most part of the reclamation, would bend towards the east and then moves parallel to the reclamation following

the general direction of the offshore currents. Far offshore, the flow is directed mainly to the north and is hardly affected by the reclamation works.

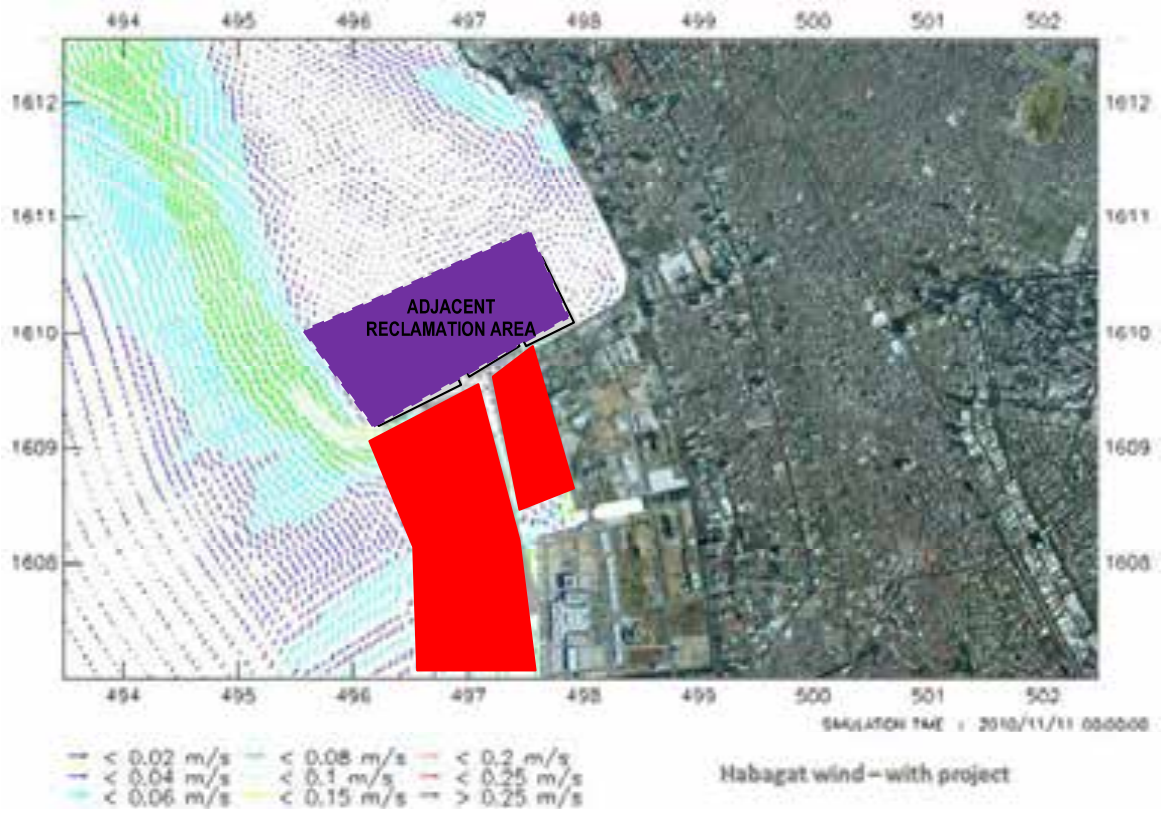


Figure 2.2.48 Predicted currents with the proposed two reclamation projects (habagat wind)

The next two figures show the effect of the reclamation projects on the horizontal current magnitude in the study area during two wind conditions, habagat and amihan. The positive and negative values in these figures represent the relative increase and decrease of flow magnitudes due to the presence of reclamation projects.

Based on the model results, it appears that the combined reclamation projects would produce marginal changes in flow magnitudes in the study area. Of the two wind conditions prevailing in the Bay, the model predicts that the changes in flow velocity fields were more pronounced during habagat wind condition as compared to amihan wind. Under the habagat event where the wind field generally comes from the south-southwest direction, areas immediate of the reclamation site (especially at the western section, see red and brown areas in the figure) current magnitudes were predicted to increase by more than 6 $cm \cdot s^{-1}$. Decrease in flow magnitudes were predicted at the leeward side of the reclamation area, due primarily to the shadowing effect of the reclamation project that significantly increase frictional drag. The predicted decrease in flow magnitude is in the range of 1 to 2 $cm \cdot s^{-1}$ during habagat wind condition in the areas fronting Roxas Boulevard.

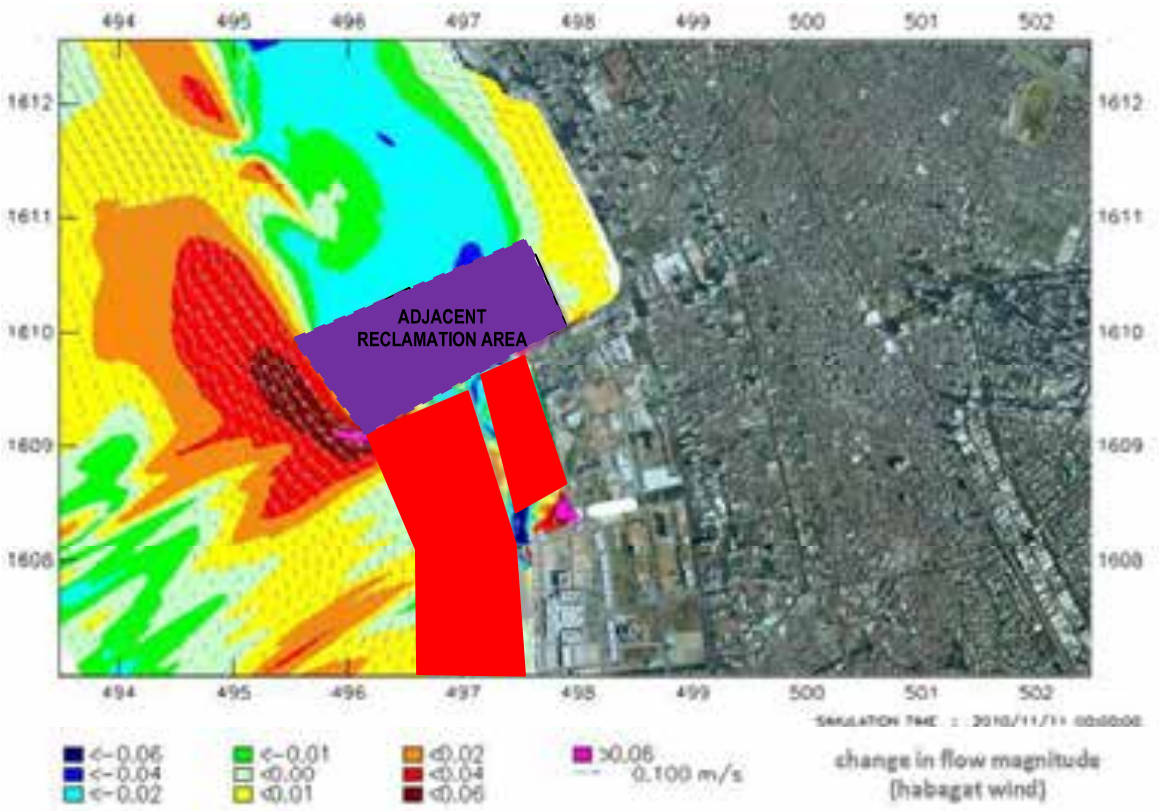


Figure 2.2.49 Predicted changes in the horizontal current magnitudes as a result of the planned reclamation during habagat event. Positive and negative values in the legend indicate increased and decreased flow velocities, respectively

For amihan wind condition scenario, the comparison of the two model runs (with and without the reclamation project) on the resulting flow magnitudes revealed no significant increase (<2.0 $cm \cdot s^{-1}$) in flow magnitude.

Similar to the results of the habagat wind scenario, the leeward side of the reclamation works would experience reduced flow speeds due to the shadowing effects of the said reclamation.

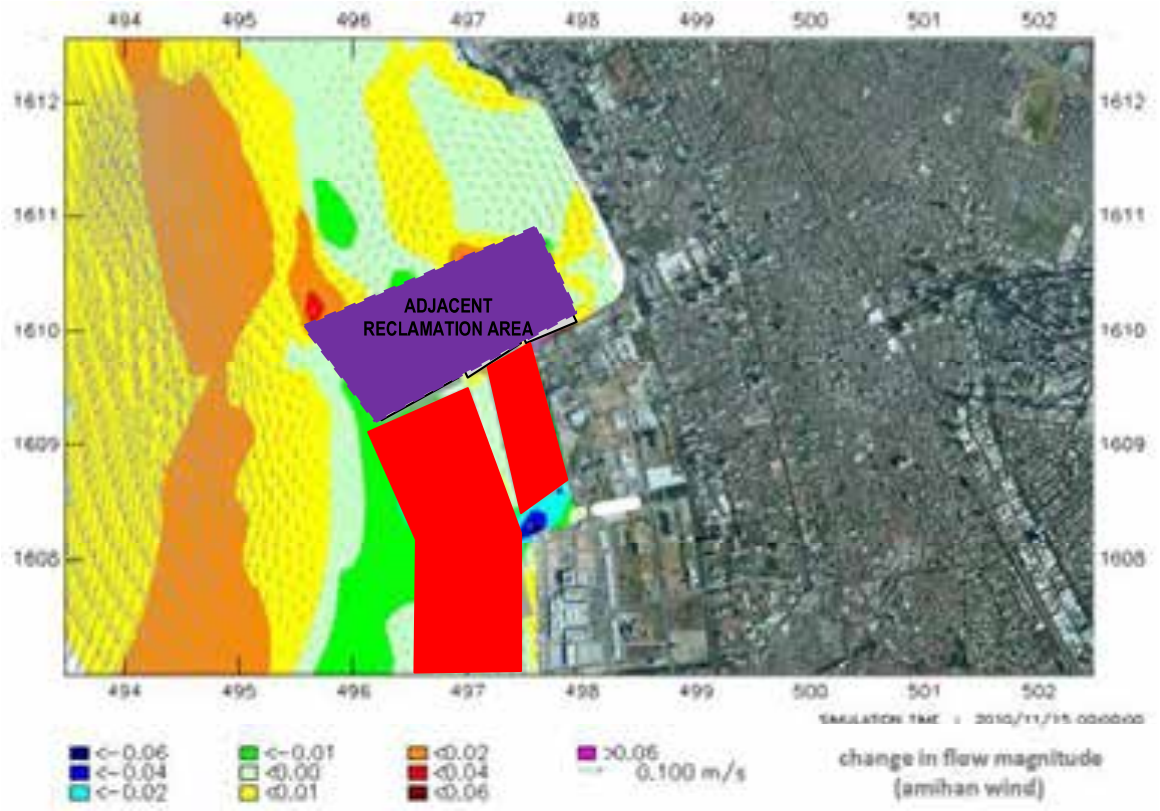


Figure 2.2.50 Predicted changes in the horizontal current magnitudes as a result of the planned reclamation during amihan event. Positive and negative values in the legend indicate increased and decreased flow velocities, respectively

In summary, based on the simulations conducted under the existing (without) and with the two combined reclamation projects in place using habagat and amihan wind conditions, the changes in flow velocity fields immediate of the project area are deemed moderate. At most, the project is predicted to increase the sea currents by 6 $cm \cdot s^{-1}$ near the reclamation works. Such increase can be easily mitigated through various engineering measures. Far offshore of the reclamation, the changes in flow velocities are deemed insignificant.

2.2.3 Water Quality

Regarding the question on *"Overall policy/ plan and or Master Plan for the whole Manila Bay Region considering that all types of projects that will be constructed/,installed and or operationalized will have tremendous/adverse impact on the quality of the water body generated from various waste sources media (domestic solid waste, sewage, industrial, commercial liquid, chemical, hazardous waste and other wastewater pollutants) from the future & existing developmental projects including the climate change effects for the whole MB Region"*

In respect of the above especially on the impact on the Manila Bay water quality, it is noted that the project involved confines only to the reclamation of land wherein the Direct and Indirect Impact Areas are limited to the project boundaries and immediate environs, shown in **Figure 1.8.** The generation of various waste water effluents will be significantly experienced during the Operations Phase wherein the various locators will be operating human activities will be involved on daily basis.

The proponent/preparer is keenly cognizant of the Supreme Court ruling relating to the quality of the Manila Bay water e.g. the "Continuing Mandamus". However, as explained in **Section 1 page 1-21**, the "Mandamus" is not applicable to the project in its current stage of planning whereby no implementation is being undertaken at this time.

Additionally, it is herewith noted that the PRA has announced a project involving a Programmatic EIS for 27,000 hectare areas in Manila Bay. The Master Plan for the Reclamation in whole Manila Bay Region can be more appropriately evaluated if and when the PRA shall have completed this Programmatic EIS.

Operational Plan of Manila Bay Coastal Strategy (OPMBCS). All new sources of discharges / waste water effluent must comply with DENR SB Classification (bathing & contact recreation) hence there will accordingly be proposing a centralized treatment facility and combined or separate sewerage system to address all the sources of water pollution during the Operations Phase of the Project.

a. **The classification by the DENR of the Manila Bay into "SB"** is itself subject to clarifications by an industry association in direct communication with the Supreme Court anchored on the following arguments:

    - The expressed intent of the Supreme Court ruling on "Mandamus" was "rehabilitation" while the reclassification represented "upgrading".

    - The "reclassification" did not specify which areas of the large Manila Bay region are to be covered; obviously some sections of the Manila Bay e.g. the ports cannot comply with this "reclassification". It was also pointed that most government buildings are likely not in compliance with effluent standards conforming to this reclassification.

b. **The setting up of a centralized treatment facility for the Project.**

    Notwithstanding the above, the proponent will nevertheless institute appropriate treatment facility which may involve a centralized Waste Water Treatment Plant (WWTP).

    The more appropriate time for designing the WWTP is prior to the operations phase of the project. The EIS herewith submitted and the ECC being applied for include only the reclamation works.

The period of stabilization of the reclaimed land is approximately one (1) year, i.e. before the construction of the locators' facilities. Thus there is sufficient period for the design and construction of a WWTP.

c. The WWTP and the Scope of the Reclamation Project

- The scope of the reclamation project covers activities up to and until the stabilization of the reclaimed land and does not include the operations phase.

- The WWTP is not relevant during the construction phase of the project.

b. **WWTP Design and the SC Ruling on Classification of Manila Bay**

- The SC ruling and the resulting DENR Administrative Order (DAO) upgrading the classification of Manila Bay to Class "A" is a subject of discussions and clarifications with the Supreme Court. The EIA Preparer/Team Leader of this project has made appropriate dialogue with the Supreme Court on this matter through the Federation of Philippine Industries. This clarification is in order not only for the reclamation project but also for the various government buildings//offices which discharge their effluents to the Manila e.g. the Supreme Court, DFA, Senate buildings, etc.

- DAO 1990-35 is not clear as to what the effluent standards are applicable to the portion of Manila Bay on which the reclamation will be undertaken.

Historical Water Quality data / Water Quality Assessment data

For the purpose of an EIS Report, which for the construction phase only, it is deemed that the information thus far provided satisfies the prescribed requirements for an EIS Report.

1. A similar adjacent project recently granted an ECC does not have also sampling for various seasons; The baselines will be established more adequately by the Multipartite Monitoring Team (MMT).

2. The construction phase will not commence until 2 ½ to 4 years from acquisition of ECC. Thus, the best time to update monitoring data is after securing of the NTP from the PRA; updating the water quality baselines at this time may be expired by the time project implementation would be undertaken.

3. Baselines will be secured by the PRA itself for its planned Programmatic EIS Study for 25,000 hectares area along the coast of the Manila Bay.

Also, the more appropriate time to undertake more detailed baselining, is when the final design shall be have completed which would include the following:

- Dredging Methodology. This would impact on the potential for silt dispersal.
- Site of the dredging works.
- Site of the silt disposal.

2.2.3.1 Degradation of Groundwater Quality

The project will not use groundwater and neither will it cause disturbance or damage to the groundwater/aquifer system which is absent at the project site (which is a portion of Manila Bay).

2.2.3.2 Degradation of Surface Water Quality

Baseline on the existing sanitation facilities (STP, SpTP, and sewerage system within the nearby communities per LGUs/barangay).

****STP- SEWAGE TREATMENT PLANT***
****SpTP- Septage TREATMENT PLANT***

Existing facilities in establishments near the project site and along the Libertad Channel are most relevant.

These are considered as creating most significant impacts because of location as shown in **Figure 2.2.51** and in the photographs, **Plate 2.2.5.** These establishments are however, outside the DIA and IIA of the Project.

Plate 2.2.5 also shows the outfall pipe from the restaurants along the Libertad Channel.

Plate 2.2.5 Outfall Pipe from the Restaurants



Restaurants by the Libertad Channel



Solid Wastes and Garbage Cluttered in the portion of Libertad Channel



Figure 2.2.51 Map indicating location of Restaurants Complex relevant to the Project

Following are the restaurants at the Dampa "Paluto" Restaurant Complex

- Sis Bro
- Shylin 1
- Squared Palutuan
- Robbies'
- Aling Tonya
- Imasan
- Kainan sa Balingay
- Sea Global
- Trinity
- Lola Ina's
- Hongkong
- Youji's
- Golden Emperor
- Shyling
- Cuzina
- Sing Side
- Lion King
- Sis

Based from interviews with some of the restaurant key personnel, it was determined that they have septic tanks.

The Sewerage and Septage System of the City of Pasay

No city-wide sewerage system is in place in the city. At present, residents and commercial establishments use on-site sewage treatment facilities or septic tanks for treatment of waste water. Due to the absence of monitoring and lack of maintenance, discharges form septic tanks make their way into the drainage lines and into the waterways. Some of the wastewater infiltrate into the ground and pose a threat to groundwater quality.

Maynilad, however, is undertaking the development of the Pasay Sewerage System—a project which will be implemented in two stages. The first stage, from 2011 to 2014, involves the construction of a conveyance system and sewage treatment plant (STP) located in Maricaban. It will have a capacity of 46 million liters per day (MLD) and is estimated to serve a population of 254,000 in the northern.

Moreover, the management, control and monitoring of these establishments are outside the scope of the project. In addition**,** the surface water bodies nearest the project site are (a) Paranaque River with a straight distance of 2.18922 km from the project and (b) Pasig River with a straight distance of 5.7.715 km.

Further, there are no project components or activities that will disturb, block or impede the flows of these surface water bodies and neither will there be discharges to these rivers.

2.2.3.3 Degradation of coastal/marine water quality

Filling and piling of soil and earthen materials into the reclamation area will result to short term, albeit localized and reversible increase in total suspended solids in the water column. The current condition of the coastal waters in the survey area reveal heavy pollution of both suspended and dissolved matter emanating from sewage run offs and domestic wastewater discharges from the Libertad Channel and Maynilad-Pagcor Pumping Station. Spot dives to verify the nature of bottom substrate was conducted with visibility in the water column measuring less than two feet (**Plate 2.2.6**). Suspended silt can be vividly seen, constantly disturbed by wave action and the influx of polluted waters from the two channels and floodgates. Garbage, debris and oily residues float in most of the shallow portions. Substrate in areas near the channels are comprised of foul-smelling silt and sandy deposits while those in the southern end of the proposed reclamation project are composed of silt and sand mixed with crushed shellfish carapace and debris.

Plate 2.2.6 Spot dives reveal very turbid waters, reducing visibility in the water column to not more than 2 feet (left); silt, sand and remnants of shellfish carapace comprise the substrate in the entire area of the proposed reclamation



While the pouring of fill materials will contribute to re-suspension of silt and substrates, as well as increments in water turbidity, survey results show that there are no significant benthic life forms nor significant fish and shellfish habitats that can be potentially negatively affected. Suspended

materials will ultimately re-settle around the site, in the same manner that silt and sediments constantly discharged from point sources in the metropolis are settled. Containment structures or curtains will be installed to minimize the dispersal of the disturbed silts and sediments from the sea bed.

During the operations phase, the potential contribution of the project to marine pollution arising from domestic wastewaters of the various locators will be mitigated using an integrated ecological solid waste processing facility, domestic wastewater treatment and sewage facility.

Further, the project will not impact on the water quality of the channels and esteros because the discharge point of the treated water effluents will be in the general vicinity of the project site and by natural sea circulation will be directed outward to the Manila Bay and not toward the channels and esteros.

By its nature, the project will cater to establishments, commercial buildings, hotels and similar the nature of which will not involve toxic and hazardous wastes.

The City of Pasay is a member of the project consortium, and being an LGU will fall within the mandate of the "Mandamus"; on the other hand it is doubtful if the establishments and residents discharging wastes water to the *esteros* or the channels are being indeed closely monitored under the Mandamus and penalized if legally appropriate.

Provided below is the sampling water sampling result test.

Table 2.2.2 Physico-Chemical Characterization of the Marine Water (360 HECTARES)

STATION	Quality Parameter	Results	Units	Standard Water Body Classification		Test Methods
				SB	SC	
1	**Wet Chemistry** **Date of Sampling: November 11, 2012**					
	pH @ 23 deg C	9.05	-	6.0-8.5	6.0-8.5	Electrometric Method
	Color, Apparent	75	PCU	(c)	(c)	Visual Comparison
	Total Dissolved Solids	18,900	mg/L	Not Specified (NS)	Not Specified (NS)	Gravity (SM2540 C)
	Oil & Grease	0.40	mg/L	2	3	Gravity (SM2540 D)
	Ammonia – N	0.12	mg/L	Not Specified (NS)	Not Specified (NS)	Pet. Ether Extraction (DENR Modified)
	Cyanide, Free	0.15	mg/L	0.05	0.05	Phenate Method (SM 4500 CN-F)
	Nitrate, -N	0.11	mg/L	Not Specified (NS)	Not Specified (NS)	Brucine
	Phosphate	0.04	mg/L	Not Specified (NS)	Not Specified (NS)	Stannous Chloride Method (SM4500-P D)
	Salinity as NaCl	17,900	mg/L	Not Specified (NS)	Not Specified (NS)	Trimetry – By Calculation
	Microbiology					

STATION	Quality Parameter	Results	Units	Standard Water Body Classification		Test Methods
				SB	SC	
	Fecal Coliform	17	MPN/100ml	200[(m)]	Not Specified (NS)	Not Specified (NS)
	Metals					
	Arsenic	0	mg/L	0.05	0.05	SDDC, Spectrophotometric
	Chromium	0	mg/L	0.1	0.1	Flame AAS
	Lead	0	mg/L	0.05	0.05	Flame AAS
	Mercury	0	mg/L	0.002	0.002	Manual Cold Vapor AAS
2	**Wet Chemistry**					
	pH @ 23 deg C	8.90	-	6.0-8.5	6.0-8.5	Electrometric Method
	Color, Apparent	25	PCU	[(c)]	[(c)]	Visual Comparison
	Total Dissolved Solids	21,000	mg/L	Not Specified (NS)	Not Specified (NS)	Gravity (SM2540 C)
	Total Suspended Solids	10	mg/L	Not Specified (NS)	Not Specified (NS)	Gravity (SM2540 D)
	Oil & Grease	0.41	mg/L	2	3	Gravity (SM2540 D)
	Ammonia – N	0.05	mg/L	Not Specified (NS)	Not Specified (NS)	Pet. Ether Extraction (DENR Modified)
	Cyanide, Free	0.15	mg/L	0.05	0.05	Phenate Method (SM 4500 CN-F)
	Nitrate, -N	0.09	mg/L	Not Specified (NS)	Not Specified (NS)	Brucine
	Phosphate	0.04	mg/L	Not Specified (NS)	Not Specified (NS)	Stannous Chloride Method (SM4500-P D)
	Salinity as NaCl	19,600	mg/L	Not Specified (NS)	Not Specified (NS)	Trimetry – By Calculation
	Microbiology					
	Fecal Coliform	4.0	MPN/100ml	200[(m)]	Not Specified (NS)	Not Specified (NS)
	Metals					
	Arsenic	0	mg/L	0.05	0.05	SDDC, Spectrophotometric
	Chromium	0	mg/L	0.1	0.1	Flame AAS
	Lead	0	mg/L	0.05	0.05	Flame AAS
	Mercury	0	mg/L	0.002	0.002	Manual Cold Vapor AAS

STATION	Quality Parameter	Results	Units	Standard Water Body Classification		Test Methods
				SB	SC	
3	**Wet Chemistry**					
	pH @ 23 deg C	8.80	-	6.0-8.5	6.0-8.5	Electrometric Method
	Color, Apparent	25	PCU	(c)	(c)	Visual Comparison
	Total Dissolved Solids	21,000	mg/L	Not Specified (NS)	Not Specified (NS)	Gravity (SM2540 C)
	Total Suspended Solids	10	mg/L	Not Specified (NS)	Not Specified (NS)	Gravity (SM2540 D)
	Oil & Grease	0.36	mg/L	2	3	Gravity (SM2540 D)
	Ammonia – N	0.04	mg/L	Not Specified (NS)	Not Specified (NS)	Pet. Ether Extraction (DENR Modified)
	Cyanide, Free	0.14	mg/L	0.05	0.05	Phenate Method (SM 4500 CN-F)
	Nitrate, -N	0.03	mg/L	Not Specified (NS)	Not Specified (NS)	Brucine
	Phosphate	0.04	mg/L	Not Specified (NS)	Not Specified (NS)	Stannous Chloride Method (SM4500-P D)
	Salinity as NaCl	21,000	mg/L	Not Specified (NS)	Not Specified (NS)	Trimetry – By Calculation
	Microbiology					
	Fecal Coliform	2.0	MPN/100ml	200(m)	Not Specified (NS)	Not Specified (NS)
	Metals					
	Arsenic	0	mg/L	0.05	0.05	SDDC, Spectrophotometric
	Chromium	0	mg/L	0.1	0.1	Flame AAS
	Lead	0	mg/L	0.05	0.05	Flame AAS
	Mercury	0	mg/L	0.002	0.002	Manual Cold Vapor AAS
4	**Wet Chemistry**					
	pH @ 23 deg C	8.16	-	6.0-8.5	6.0-8.5	Electrometric Method
	Color, Apparent	25	PCU	(c)	(c)	Visual Comparison
	Total Dissolved Solids	19,500	mg/L	Not Specified (NS)	Not Specified (NS)	Gravity (SM2540 C)
	Total Suspended Solids	12	mg/L	Not Specified (NS)	Not Specified (NS)	Gravity (SM2540 D)

STATION	Quality Parameter	Results	Units	Standard Water Body Classification		Test Methods
				SB	SC	
	Oil & Grease	0.42	mg/L	2	3	Gravity (SM2540 D)
	Ammonia – N	2.7	mg/L	Not Specified (NS)	Not Specified (NS)	Pet. Ether Extraction (DENR Modified)
	Cyanide, Free	0.13	mg/L	0.05	0.05	Phenate Method (SM 4500 CN-F)
	Nitrate, -N	0.17	mg/L	Not Specified (NS)	Not Specified (NS)	Brucine
	Phosphate	0.28	mg/L	Not Specified (NS)	Not Specified (NS)	Stannous Chloride Method (SM4500-P D)
	Salinity as NaCl	17,000	mg/L	Not Specified (NS)	Not Specified (NS)	Trimetry – By Calculation
	Microbiology					
	Fecal Coliform	170	MPN/100ml	200(m)	Not Specified (NS)	Not Specified (NS)
	Metals					
	Arsenic	0	mg/L	0.05	0.05	SDDC, Spectrophotometric
	Chromium	0	mg/L	0.1	0.1	Flame AAS
	Lead	0	mg/L	0.05	0.05	Flame AAS
	Mercury	0	mg/L	0.002	0.002	Manual Cold Vapor AAS
5	**Wet Chemistry** **Date of Sampling: November 11, 2012**					
	pH @ 27 deg C	7.30	PCU	6.0-8.5	6.0-8.5	Electrometric Method
	Settable Solids	0	mg/L	Not Specified (NS)	Not Specified (NS)	Visual Comparison
	Total Dissolved Solids	29, 600	mg/L	Not Specified (NS)	Not Specified (NS)	Gravity (SM2540 C)
	Oil & Grease	0.52	mg/L	2	3	Pet. Ether Extraction (DENR Modified)
	Ammonia –N	0.08	mg/L	Not Specified (NS)	Not Specified (NS)	Phenate Method (SM45000-NH3 F)
	Cyanide, Free	0.30	mg/L	0.05	0.05	Ion Selective Electrode (SM 4500 CN-F)
	Nitrate, -N	0	mg/L	Not Specified (NS)	Not Specified (NS)	Brucine
	Phosphate	0.04	mg/L	Not	Not	Stannous Chloride

STATION	Quality Parameter	Results	Units	Standard Water Body Classification		Test Methods
				SB	SC	
				Specified (NS)	Specified (NS)	Method (SM4500-P D)
	Salinity as NaCl	25, 800	mg/L	Not Specified (NS)	Not Specified (NS)	Trimetry –By Calculation
	Microbiology					
	Fecal Coliform	350	MPN/100 ml	200[(m)]	Not Specified (NS)	Not Specified (NS)
	Metals					
	Arsenic	0	mg/L	0.05	0.05	SDDC, Spectrophotometric
	Chromium	0	mg/L	0.1	0.1	Flame AAS
	Lead	0	mg/L	0.05	0.05	Flame AAS
	Mercury	0	mg/L	0.002	0.002	Manual Cold Vapor AAS
6	**Wet Chemistry**					
	pH @ 27.5 deg C	9.6	-	6.0-8.5	6.0-8.5	Electrometric Method
	BOD5	8	mg/L	5	7(10)	Azide Modification Winkler
	COD	797	mg/L	Not Specified (NS)	Not Specified (NS)	Open Reflux Method
	Total Suspended Solids	29	mg/L	Not Specified (NS)	Not Specified (NS)	Gravimetry
	Oil & Grease	0.9	mg/L	2	3	Pet. Ether Extraction
	Hexavalent Chromium	<0.003	mg/L	0.1	0.1	Diphenylcarbonate Colorimetric Method
	Chloride	10,000	mg/L	Not Specified (NS)	Not Specified (NS)	Argentometric Method
	Dissolved Oxygen	9.5	mg/L	70	70	Winkler/Titrimetric
	Nitrate – N	0.08	mg/L	Not Specified (NS)	Not Specified (NS)	Colorimetry, Brucine
	Phosphorus-P	0.02	mg/L	Not Specified (NS)	Not Specified (NS)	Stannous Chloride Method
	Metals					
	Arsenic	<0.01	mg/L	0.05	0.05	SDC Spectrophotometry
	Cadmium	<0.006	mg/L	0.01	0.01	Flame AAS
	Mercury	<.0001	mg/L	0.002	0.002	Cold Vapor AAS
	Microbiology					
	Total Coliform	<1.8	MPN/100 mL	1,000[(m)]	5,000[(m)]	Multiple Tube Fermentation Technique

STATION	Quality Parameter	Results	Units	Standard Water Body Classification		Test Methods
				SB	SC	
	Fecal Coliform	<1.8	MPN/100 mL	200[(m)]	Not Specified (NS)	Not Specified (NS)
7	**Wet Chemistry**					
	pH @ 27 deg C	7.94	PCU	6.0-8.5	6.0-8.5	Electrometric Method
	Settable Solids	0	mg/L	Not Specified (NS)	Not Specified (NS)	Visual Comparison
	Total Dissolved Solids	28, 600	mg/L	Not Specified (NS)	Not Specified (NS)	Gravity (SM2540 C)
	Oil & Grease	0.54	mg/L	2	3	Pet. Ether Extraction (DENR Modified)
	Ammonia –N	3.4	mg/L	Not Specified (NS)	Not Specified (NS)	Phenate Method (SM45000-NH3 F)
	Cyanide, Free	0.24	mg/L	0.05	0.05	Ion Selective Electrode (SM 4500 CN-F)
	Nitrate, -N	0	mg/L	Not Specified (NS)	Not Specified (NS)	Brucine
	Phosphate	0.23	mg/L	Not Specified (NS)	Not Specified (NS)	Stannous Chloride Method (SM4500-P D)
	Salinity as NaCl	26, 600	mg/L	Not Specified (NS)	Not Specified (NS)	Trimetry –By Calculation
	Microbiology					
	Fecal Coliform	14, 000	MPN/100 ml	200[(m)]	Not Specified (NS)	Not Specified (NS)
	Metals					
	Arsenic	0	mg/L	0.05	0.05	SDDC, Spectrophotometric
	Chromium	0	mg/L	0.1	0.1	Flame AAS
	Lead	0	mg/L	0.05	0.05	Flame AAS
	Mercury	0	mg/L	0.002	0.002	Manual Cold Vapor AAS
8	**Wet Chemistry**					
	pH @ 27.5 deg C	9.4	-	6.0-8.5	6.0-8.5	Electrometric Method
	BOD5	7	mg/L	5	7(10)	Azide Modification Winkler
	COD	797	mg/L	Not Specified (NS)	Not Specified (NS)	Open Reflux Method
	Total Suspended Solids	27	mg/L	Not Specified (NS)	Not Specified (NS)	Gravimetry

STATION	Quality Parameter	Results	Units	Standard Water Body Classification		Test Methods
				SB	SC	
	Oil & Grease	0.8	mg/L	2	3	Pet. Ether Extraction
	Hexavalent Chromium	<0.003	mg/L	0.1	0.1	Diphenylcarbonate Colorimetric Method
	Chloride	9,570	mg/L	Not Specified (NS)	Not Specified (NS)	Argentometric Method
	Dissolved Oxygen	9.3	mg/L	70	70	Winkler/Titrimetric
	Nitrate – N	0.2	mg/L	Not Specified (NS)	Not Specified (NS)	Colorimetry, Brucine
	Phosphorus-P	0.04	mg/L	Not Specified (NS)	Not Specified (NS)	Stannous Chloride Method
	Metals					
	Arsenic	<0.01	mg/L	0.05	0.05	SDC Spectrophotometry
	Cadmium	<0.006	mg/L	0.01	0.01	Flame AAS
	Mercury	<.0001	mg/L	0.002	0.002	Cold Vapor AAS
	Microbiology					
	Total Coliform	<1.8	MPN/100 mL	1,000[(m)]	5,000[(m)]	Multiple Tube Fermentation Technique
	Fecal Coliform	<1.8	MPN/100 mL	200[(m)]	Not Specified (NS)	Not Specified (NS)
9	**Wet Chemistry**					
	pH @ 27.5 deg C	9.2	-	6.0-8.5	6.0-8.5	Electrometric Method
	BOD5	7	mg/L	5	7(10)	Azide Modification Winkler
	COD	998	mg/L	Not Specified (NS)	Not Specified (NS)	Open Reflux Method
	Total Suspended Solids	26	mg/L	Not Specified (NS)	Not Specified (NS)	Gravimetry
	Oil & Grease	0.8	mg/L	2	3	Pet. Ether Extraction
	Hexavalent Chromium	<0.003	mg/L	0.1	0.1	Diphenylcarbonate Colorimetric Method
	Chloride	9,970	mg/L	Not Specified (NS)	Not Specified (NS)	Argentometric Method
	Dissolved Oxygen	9.7	mg/L	70	70	Winkler/Titrimetric
	Nitrate – N	03	mg/L	Not Specified (NS)	Not Specified (NS)	Colorimetry, Brucine
	Phosphorus-P	0.02	mg/L	Not Specified	Not Specified	Stannous Chloride Method

STATION	Quality Parameter	Results	Units	Standard Water Body Classification		Test Methods
				SB	SC	
				(NS)	(NS)	
	Metals					
	Arsenic	<1.8	mg/L	0.05	0.05	SDC Spectrophotometry
	Cadmium	<1.8	mg/L	0.01	0.01	Flame AAS
	Mercury	<1.8	mg/L	0.002	0.002	Cold Vapor AAS
	Microbiology					
	Total Coliform	<1.8	MPN/100 mL	1,000[(m)]	5,000[(m)]	Multiple Tube Fermentation Technique
	Fecal Coliform	<1.8	MPN/100 mL	200[(m)]	Not Specified (NS)	Not Specified (NS)

*Provided in **Annex 5** is the Test Results.*

Based from the above water test results, all of the sampling three (3) stations exceeded from the prescribed DENR Standard in terms of the following parameters:

- *BOD5 or Biochemical Demand for Oxygen 5* indicates the quantity of oxygen used in five (5) days for the biological decay of the compounds present in water.
- *Dissolved Oxygen*- refers to the level of free, non-compound oxygen present in water or other liquids. A dissolved oxygen level that is too high or too low can harm aquatic life and affect water quality.
- *pH* - measures how acidic the water. Extremes in pH can make the water inhospitable to life. Acidic water also speeds the leaching of heavy metals harmful to fish.

Table 2.2.3 Test Results Samples Taken 07 January 2016

Station	Quality Parameter	Results	Units	Standard Water Body Classification		Test Methods
				SB	SC	
10	**Metals**					
	Lead	<0.05	mg/L	0.05	0.05	Flame AAS
	Microbiology					
	Total Coliforms	160,000	MPN/100mL	1,000[(m)]	5,000[(m)]	Multiple Tube Fermentation Technique
	Fecal Coliforms	28,000	MPN/100mL	200[(m)]	Not Specified (NS)	Not Specified (NS)
	Wet Chemistry					
	Biological Oxygen Demand	33	mg/L	Not Specified (NS)	Not Specified (NS)	Azide Modification Winkler (SM 5210B)
	Hexavalent Chromium	< 0.003	mg/L	0.1	0.1	Diphenycarbazide, Colorimetric Method (SM3500-Cr B)
	Biological	33	mg/L	5	7(10)	Azide Modification

Station	Quality Parameter	Results	Units	Standard Water Body Classification		Test Methods
				SB	SC	
	Oxygen Demand					Winkler (SM 5210B)
11	**Metals**					
	Lead	< 0.05	mg/L	0.05	0.05	Flame AAS
	Microbiology					
	Total Coliforms	170	MPN/100mL	1,000[(m)]	5,000[(m)]	Multiple Tube Fermentation Technique
	Fecal Coliforms	170	MPN/100mL	200[(m)]	Not Specified (NS)	Not Specified (NS)
	Wet Chemistry					
	Biological Oxygen Demand	5	mg/L	5	7(10)	Azide Modification Winkler (SM 5210B)
	Hexavalent Chromium	< 0.003	mg/L	0.1	0.1	Diphenycarbazide, Colorimetric Method (SM3500-Cr B)
12	**Metals**					
	Lead	< 0.05	mg/L	0.05	0.05	Flame AAS
	Microbiology					
	Total Coliforms	< 1.8	MPN/100mL	1,000[(m)]	5,000[(m)]	Multiple Tube Fermentation Technique
	Fecal Coliforms	< 1.8	MPN/100mL	200[(m)]	Not Specified (NS)	Multiple Tube Fermentation Technique
	Wet Chemistry					
	Biological Oxygen Demand	16	mg/L	5	7(10)	Azide Modification Winkler (SM 5210B)
	Hexavalent Chromium	< 0.003	mg/L	0.1	0.1	Diphenycarbazide, Colorimetric Method (SM3500-Cr B)
13	**Metals**					
	Lead	< 0.05	mg/L	0.05	0.05	Flame AAS
	Microbiology					
	Total Coliforms	350	MPN/100mL	1,000[(m)]	5,000[(m)]	Multiple Tube Fermentation Technique
	Fecal Coliforms	350	MPN/100mL	200[(m)]	Not Specified (NS)	Not Specified (NS)
	Wet Chemistry					
	Biological Oxygen Demand	5	mg/L	5	7(10)	Azide Modification Winkler (SM 5210B)
	Hexavalent Chromium	< 0.003	mg/L	0.1	0.1	Diphenycarbazide, Colorimetric Method (SM3500-Cr B)
	Metals					
	Lead	< 0.05	mg/L	0.05	0.05	Flame AAS
	Microbiology					
	Total Coliforms	240	MPN/100mL	1,000[(m)]	5,000[(m)]	Multiple Tube

Station	Quality Parameter	Results	Units	Standard Water Body Classification		Test Methods
				SB	SC	
14						Fermentation Technique
	Fecal Coliforms	240	MPN/100mL	200(m)	Not Specified (NS)	Not Specified (NS)
	Wet Chemistry					
	Biological Oxygen Demand	5	mg/L	Not Specified (NS)	Not Specified (NS)	Azide Modification Winkler (SM 5210B)
	Hexavalent Chromium	< 0.003	mg/L	0.1	0.1	Diphenycarbazide, Colorimetric Method (SM3500-Cr B)
Note: Both the standards for "SB" and "SC" are noted above. Compliance will be made to the appropriate standards which is taken to be DENR SB Classification for Manila Bay.						

Footnotes for Table 2.2.3.

(c) – No abnormal discoloration from unnatural causes

(m) – These values refer to the geometric mean of the most probable number of coliform organism during a 3-month period and that the limit indicated shall not be exceeded in 20 percent of the samples taken during the same period

As may be seen from the most recent sampling and results:

- Based on the results of the recent water sampling test conducted, it may be seen that Station 10 has the highest concentration of coliforms and BOD. Sampling Station 10 is the station along Libertad channel which is situated near the septic and water discharge of the *Dampa Paluto* restaurants (See **Figure 2.2.52**) which may obviously cause the high concentration results of BOD and coliform.



Figure 2.2.52 Consolidated Map of the Various Water Sampling Stations

The map of the sampling stations is shown in **Figure 2.2.53.**

Table 2.2.4 Results of Silt/Sediments Tests at Project Site

Test Description	Results	Units	MDL	Test Methods	Date Analyzed	By
Sample No.: P00051069-01 Sample ID: MB S1			Date Sampled: 08-24-14 00:00 Matrix: Sludge			
-Metals-						
Arsenic	1.4	mg/kg	0.2ˆ	Gaseous Hydride AAS	09/03/14	PPG
Cadmium	ND	mg/kg	0.1	Flame AAS	09/04/14	PPG
Lead	5.2	mg/kg	1.0	Flame AAS	09/03/14	RRH
Mercury -Wet Chemistry-	ND	mg/kg	0.05	Manual Cold Vapor AAS	09/02/14	NAP
Hexavalent Chromium	ND	mg/kg	1.3ˆ	Diphenylcarbazide, Colorimetric Method (SM3500-CrB)	09/05/14	ORF
Sample No.: P00051069-02 Sample ID: MB S2			Date Sampled: 08-24-14 00:00 Matrix: Sludge			
-Metals-						
Arsenic	2.0	mg/kg	0.3ˆ	Gaseous Hydride AAS	09/03/14	PPG
Cadmium	ND	mg/kg	0.1	Flame AAS	09/04/14	PPG
Lead	5.7	mg/kg	1.0	Flame AAS	09/03/14	RRH
Mercury -Wet Chemistry-	ND	mg/kg	0.05	Manual Cold Vapor AAS	09/02/14	NAP
Hexavalent Chromium	ND	mg/kg	0.5ˆ	Diphenylcarbazide, Colorimetric Method (SM3500-CrB)	09/05/14	ORF

*Provided in **Annex 5** is the Test Results.*



Figure 2.2.53 Silt/Sediments Sampling Station Map

DISCUSSION ON POSSIBLE INCREASE THE DEGREE OF POLLUTION LOADINGS DUE TO THE PROPOSED PROJECT.

- It may not exactly be correct that this project which involves only the construction phase (Phase 1) will definitely increase the degree of pollution inasmuch as the main concern, during this phase, sediment load for which the dredging methodologies of international standards are available to preserve the water quality for this parameter.

- BOD loadings, CODs, coliforms, Oil and Grease are more relevant during the operations phase (Phase 2) which is not in the scope of this EIS Report and of the ECC application.

- In respect of the need of the PRA to develop a Master Plan/Road Map, the PRA is undertaking a Programmatic EIS Study for approximately 27,000 hectares of planned reclamation in Manila Bay. The relevant water baseline parameters are to be related to the potential impacts of the construction phase which involves mainly:

  (a) Dredging at project site with the potential for disturbing the sea bed causing dispersion of silt and associated pollutive elements principally metals.

  (b) Parameters associated with human activities e.g. coliform, BOD, organics are more appropriate during the operations phase.

The data obtained from published documents e.g. "Manila Bay Area Environmental Atlas" are herein cited:

SEDIMENT QUALITY

Trace Elements in Sediments

Sediments are usually a useful medium of monitoring pollutants in aquatic systems due to their ability to accumulate contaminants while maintaining reasonable uniform composition (Larsen and Jensen, 1989; Chapman, et.al., 1992). Most eroded materials are trapped in

reservoirs, lakes and food plains or much of it is deposition in deltas, bays and estuaries (Gehm and Bregman, 1976).

Results of sediment grab samples collected for heavy metals are shown in ***Table 2.2.5*** *Sediment samples were collected from nine stations within the Bay and analyzed in the tube-excited x-ray fluorescence (XRF) systems using secondary targets, silver (Ag) and iron (Fe), and in a radioisotope-excited XRF using an Americium-241 (^{241} Am) as excitation source.*

The XRF with Ag secondary target was used to quantify the elements, manganese (Mn) and lead (Pb), while the Fe target was used to quantify the elements sodium (NA) and chromium (Cr). To determine the presence of heavy metals like cadmium (Cd) and mercury (Hg), the radioisotope XRF was used, employing the ^{241} Am as excitation source.

Results of analysis showed Cr levels were higher in stations 1,2 and 3 (50-71 parts per million or ppm). Copper (Cu) levels ranged from 56 to 90 ppm. Zinc (Zn) levels varied from 75 to 124 ppm, with stations 1, 2 and 6 exhibiting > 100 ppm level. Pb level ranged from 13-18 ppm.

Stations 1, 2, and 3 (northern part of the Bay, coastal areas of Bulacan, and Pampanga, respectively) exceeded the predicted no-effect concentration (PNEC) or threshold value for Cr (based on the low limit of HK ISQV). For Cu, all sites generally exceeded the PNEC, while the levels of Pb in all sites were acceptable. Nickel (Ni) concentrations were all below the criteria values. ***2.2.5*** *gives a summary of the results for these elements together with the PNEC values adopted by the MB-RRA for each of the elements. See also Maps on Heavy Metals (Cr, Cu, Fe, Ni, and Zn).*

Sediments from stations 6 and 7 (eastern side of the bay, Cavite coastal areas) had slightly different elemental composition profiles, particularly with the elements calcium (Ca) and chlorine (Cl), than the rest of the samples. This is indicated that the sediments from this part of the Bay may have a different source.

Table 2.2.5 Summary of Concentrations (in mg/kg) of Selected Trace Elements in Sediments

Sample Code	Chromium (Cr)	Copper (Cu)	Zinc (Zn)	Lead (Pb)	Nickel (Ni)
MB-IEMP #1	139.0	65.9	124.0	13.0	16.0
MB-IEMP #2	127.0	56.7	102	14.1	16.8
MB-IEMP #3	107.0	69.6	85.7	15.7	17.4
MB-IEMP #4	67.6	73.9	74.6	8.69	17.1
MB-IEMP #5	52.2	84.7	84.5	18.2	18.7
MB-IEMP #6	58.4	75.5	104.3	14.3	9.9
MB-IEMP #7	49.9	90.3	86.1	13.1	12.0
MB-IEMP #8	71.5	71.2	122.0	26.6	10.2
MB-IEMP #9	71.4	77.2	80.4	20.4	18.0
Average	**82.7±27.8**	**73.7±7.1**	**96.0±15.2**	**16.0±4.1**	**15.1±3.0**



Figure 2.2.54. Heavy Metals (Chromium) in Sediments

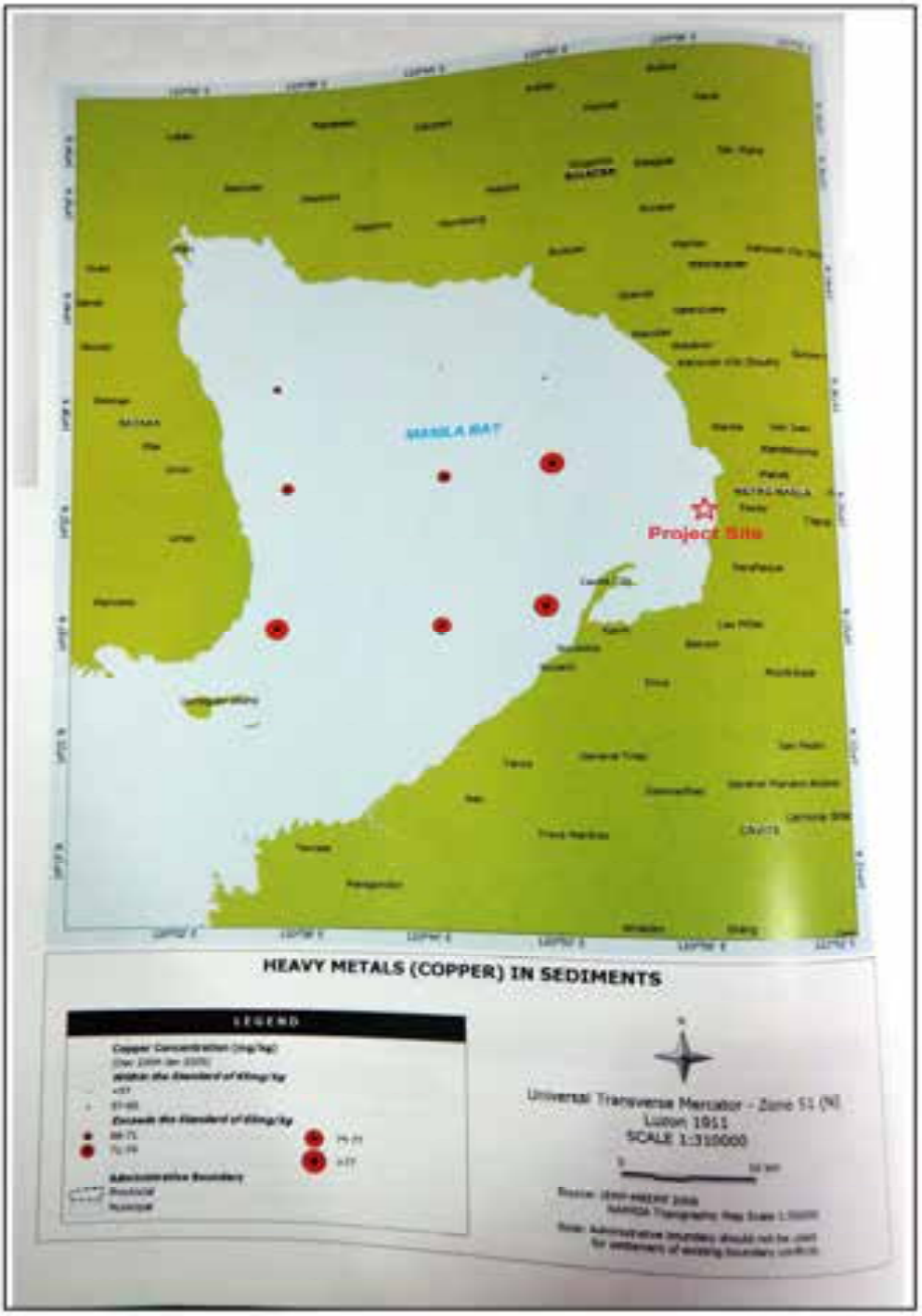


Figure 2.2.55. Heavy Metals (Copper) in Sediments

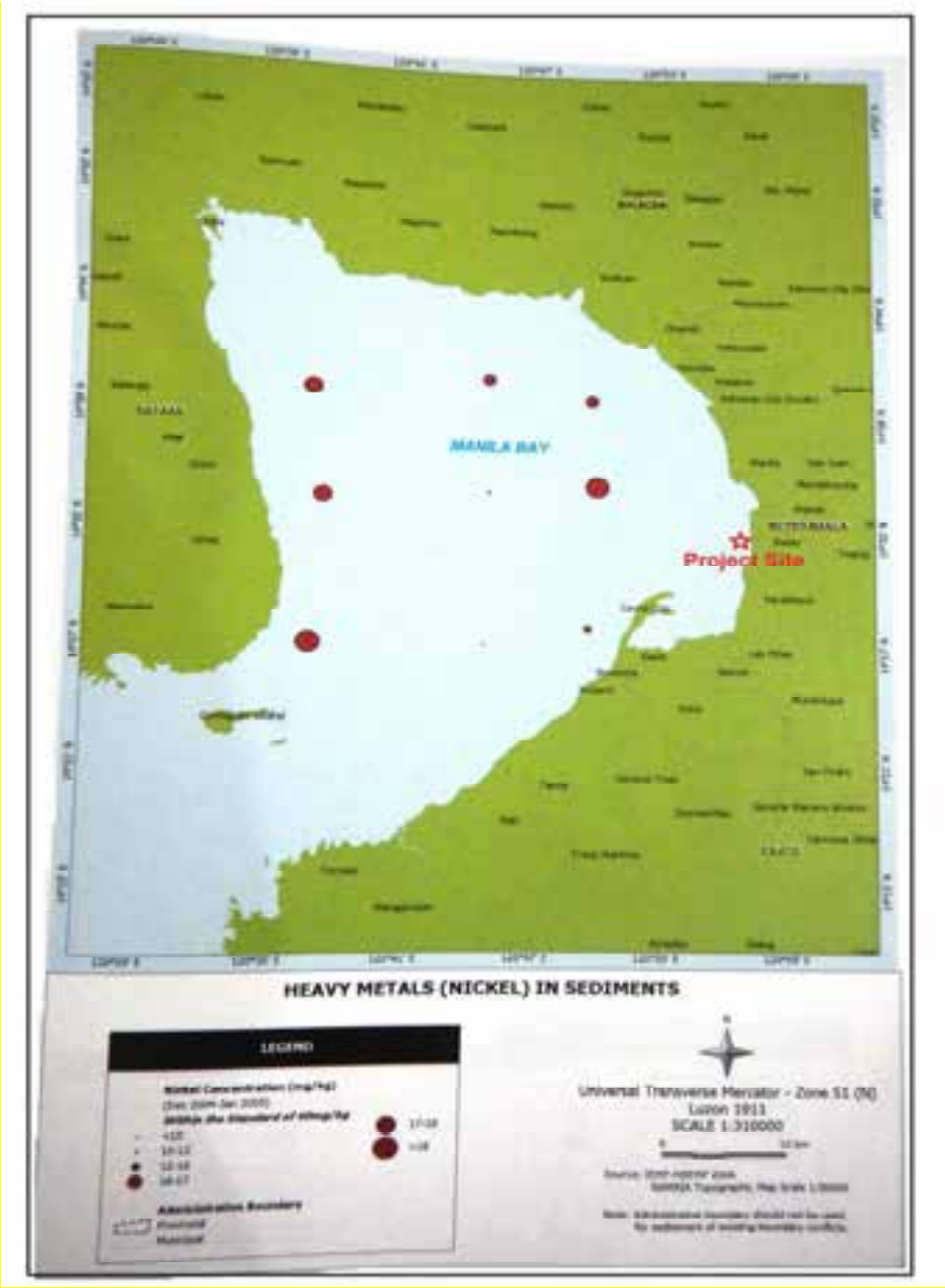


Figure 2.2.56 Heavy Metals (Nickel) in Sediments

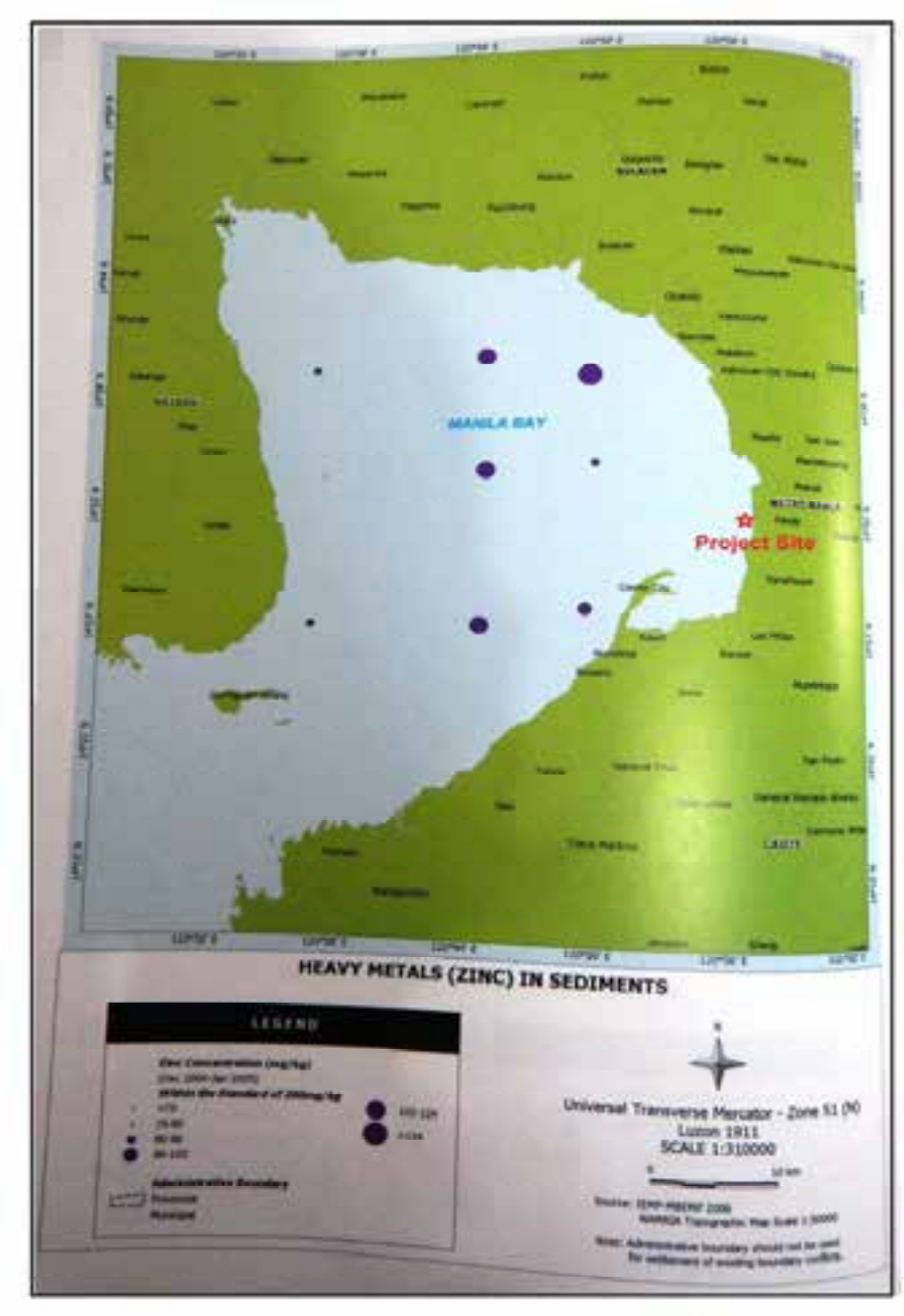


Figure2.2.57. Heavy Metals (Zinc) in Sediments

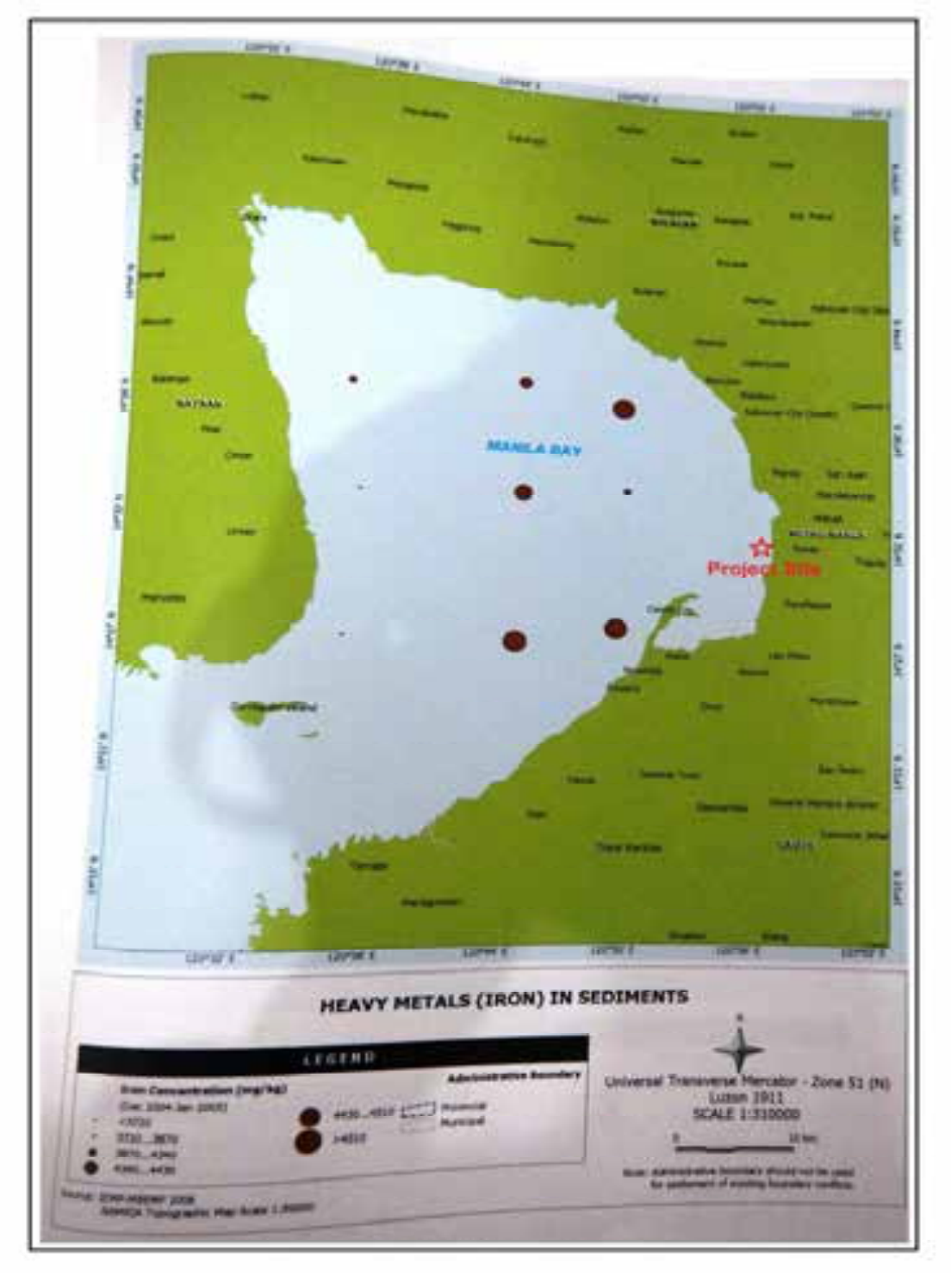


Figure 2.2.58 Heavy Metals (Iron) in Sediments

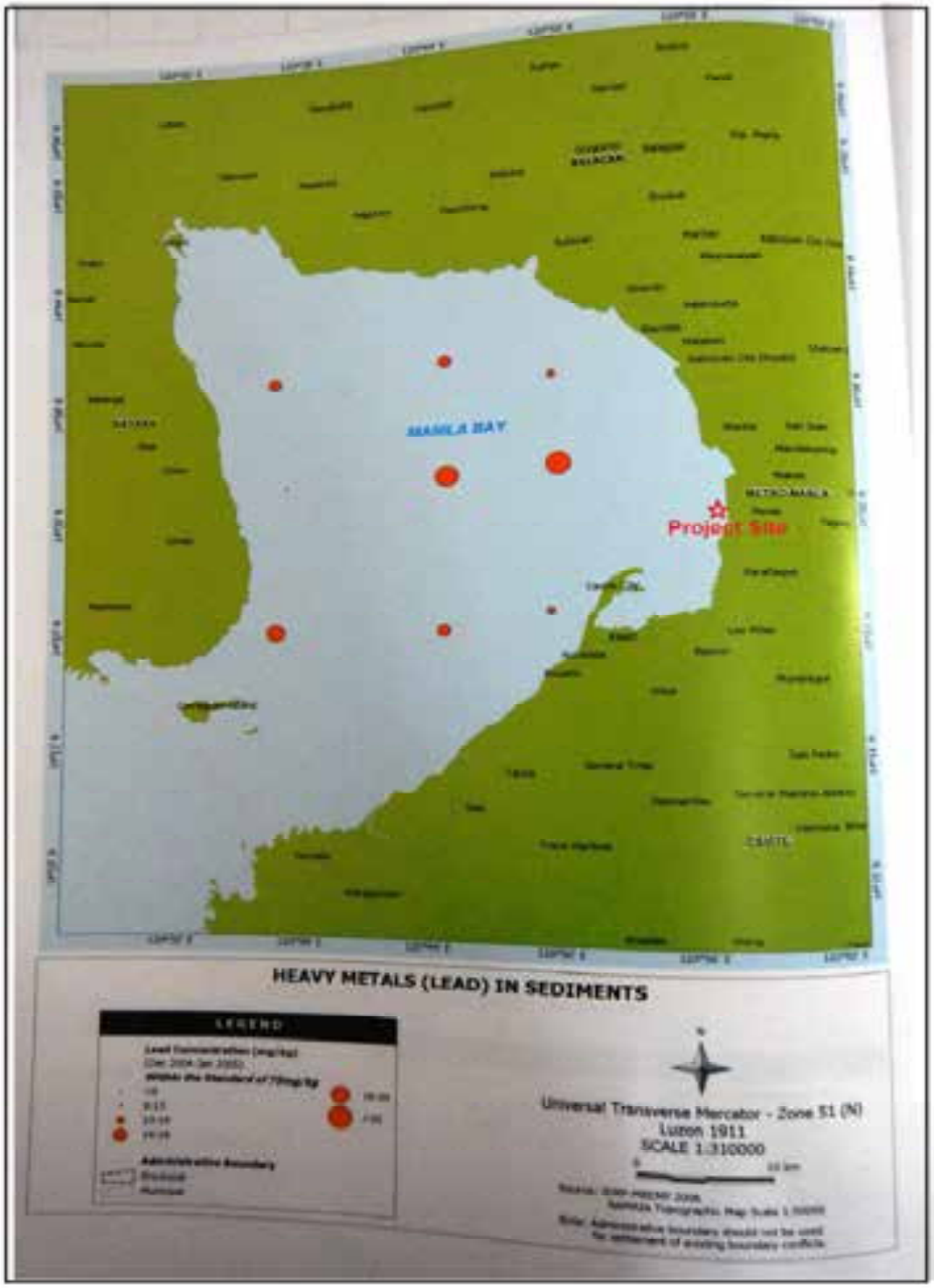


Figure 2.2.59 Heavy Metals (Lead) in Sediments

It is gleaned from the above discussions (pages **2.2.76-2.2-83**) and confirmed by the results of primary data herein reported that metals are not of concern in the project site but could be of concern outside the impact areas.

Nevertheless when the final dredging plans (including sites to be dredged and sites on which to dump the dredged materials) more detailed analysis especially of metals in sediments will have to be undertaken.

Further, the proposed Programmatic EIS Study for Manila Bay of the Philippine Reclamation Authority will provide more updated details on the water quality in Manila Bay. Part of the requirements for water quality tests is provided in **Table 2.2.6.**

Table 2.2.6 Partial Water Quality Test Requirements in the PRA Project

Parameter Types	Parameters	Minimum Detection Limit
In situ Parameters (profile at 1m intervals through the water column)	Temperature	0.1^{0}C
	pH	0.01 pH & 0.1^{0}C
	Transparency (Secchi Depth)	0.1m
	Turbidity	0.02NTU
	Salinity	0.01ppt
Laboratory Analyses (water samples taken at 1m below the surface, mid-depth, and 1m above the seabed)	Coliform bacteria	10 MPN/ml
	Fecal Coliform	10 MPN/ml
	Chlorophyll-A	0.1mg/l
	Total Suspended Solids	2mg/l
	Ammonia-Nitrogen	0.01mg/l (NH3-N)
	Phosphate-Phosphorous	0.01mg/l (TP)
	PCBs	1µg/l
	Total Petroleum Hydrocarbon	0.1mg/l
	Dissolved Oxygen	0.1mg/l
	Total Organic Carbon	0.1mg/l
	Mercury	0.1µg/l
	Arsenic	5µg/l
	Cadmium	5µg/l
	Lead	5µg/l
	Hexavalent Chromium	5µg/l
	Copper	5µg/l
	Zinc	5µg/l
	Nickel	5µg/l

2.2.4 Freshwater Ecology

There are no significant freshwater systems within the impact areas of the proposed reclamation site. Freshwater, mixed with domestic wastewaters, emanate from the Libertad Channel and Maynilad-Pagcor pumping stations, are basically storm drains and not suitable bodies of surface water for the existence of significant fish stocks or sizeable invertebrate communities. Freshwater discharges from these channels, as well as from other floodgates and waterways spilling from the Pasig River further to the south, are also not ecologically conducive for aquaculture or recreational uses. There will not be discharges from the reclamation project to these channels; discharges of treated effluents will be to the bay.

Summary of endemicity / conservation status

Stocks of Tilapia (*Oreochromis sp*) occur in the nearshore area, presumably spilled-over from the Pasig River and have acclimatized and reproduced in the area but these fishes are neither endemic to the site or are threatened.

Abundance of ecologically and economically important species

There are no ecologically important species of freshwater fish and benthos in the proposed reclamation project. The flathead Mullet (*Mugil cephalus*; Talilong or Banak) are known to enter the channels during high tides but the movement of these fish will not be hindered nor impeded by reclamation works. Moreover, the Mullet only occasionally enters the nearshore areas in Manila Bay owing to the poor water quality which limits algae growth and food availability for this species.

Presence of pollution indicator species

Forty-four manta tow survey pathways and three spot dives indicate the absence of diverse and significant population of fish and invertebrates in the proposed projects area, including mixing areas where the freshwater outfalls are located. The absence of a significant distribution of species of bivalves that are normally monitored for episodes of marine pollution was also noted. Being filter feeders, mussels and oysters can be good indicators of marine biotoxin levels but oyster and mussel farming are not being practiced in the project area. The nearest mussel farms are in the shallow waters east of the Paranaque-Bacoor border. The presence of plankton species that can potentially trigger harmful algal blooms was detected in the plankton community survey and is discussed in **Section 2.2** on results of plankton community study. It should be noted that HABs are the principal causes of episodes of paralytic shellfish poisoning (PSP) in the mussel and oyster farms in Manila Bay. Three phytoplankton species that can potentially trigger algal blooms were detected in the plankton survey.

2.2.4.1 Threat to existence and/or loss of species and habitats of important ecological value

The most likely ecological stressors potentially emanating from proposed project are sediment streams and re-suspension of silt loads currently sequestered in soft-bottom substrates. The benthic profile of the proposed project site as verified from systematic snorkeling and manta tow surveys reveal the absence of important ecological habitats and resources in the freshwater outfall area. Localized sediment incursions will not have impacts on the extremely lean presence of fish species (mostly Tilapia) in the area.

2.2.4.2 Threat to abundance, frequency and distribution of species

The project does not pose any threat to the abundance and distribution of fish species, bivalves or invertebrates, due to the absence of these animals in stock levels that can be seriously impaired. Tilapia fishes are hardy and will withstand changes in turbidity or will simply move out to deeper waters. In a similar manner, the survey did not find any significant distribution of epiphytes and macro-algae in the area.

2.2.5 Marine Ecology

Baseline surveys in the impact areas of proposed reclamation site were conducted by a team of fisheries and marine biologists on September 15, 2012 and again on August 13-14, 2014. The assessment was focused on determining existence and subsequently, defining ecological attributes of three (3) principal coastal resources, i.e., (i) coral reefs, (ii) seagrass, and (iii) reef-associated fish communities. Mangroves are absent in the proposed project site and in contiguous coastlines. Key informants also declared that no coral reefs exist in the area and fisheries resources are insignificant. In spite of these preliminary findings, the survey team nevertheless proceeded to verify and investigate a large swath of the coastal environment within the proposed reclamation site itself, with the objective of validating the alleged absence of significant benthic life forms in the area. A stretch of coastal waters more than 3.2 kilometers long was then subjected to intensive manta tow surveys, bottom substrate verification through spot dives and systematic snorkeling appraisal in shallow portions where underwater inspection through scuba cannot be employed.

Manta tow surveys and spot dives were employed to verify the presence or absence of benthic communities such as coral life forms, macro-invertebrate communities, demersal fish populations, algae and epiphytes in the bottom substrate. Conducted broadly, the manta tow survey is designed to generate a good estimation of habitat types and distribution of associated benthic resources over large impact areas and over longer stretches of coastal waters. In areas where significant coral reefs occur, results from a manta tow survey is used to pinpoint the location of specific stations where more detailed scientific underwater coral characterization employing line intercept transects will be undertaken. Macro-invertebrate sampling was conducted through core sampling in shallow areas and actual snorkeling surveys in rocky crevices in the breakwaters currently lining the coastline of the study area. To validate fisheries resources and catch per unit effort, a 500-meter bottom set gill net was used during the actual fishing operations.

A total of forty-four (44) manta tow observation stations were conducted within the proposed reclamation site. Observations from manta tow pathways covered a breadth of approximately 10 to 20 meters of coastal waters in the shallow portion of the sea in the proposed reclamation site and stretched to about 3.2 kilometers towards the Paranaque area. These were supplemented by three (3) spot dives inside and outside of the proposed three (3) stations where actual fishing was conducted to verify presence of fish species, five (5) plankton community survey stations, three (3) stations for meiofauna investigation and random surveys for the presence of macro-invertebrates in rocky portions of the breakwater lining the SM Mall of Asia perimeter. Systematic snorkeling around areas where species of fish were witnessed were also undertaken in order to determine presence of significant stocks of fish that are of commercial importance.

Species composition, abundance and density of phytoplankton and zooplankton communities were determined using plankton net vertically lowered and towed from sub-surface depths. Shannon-Weaver Diversity/Evenness Indices and bio-assessment metrics are then derived from the results of the sampling. Identification of phytoplankton species that can enrich to become harmful algal blooms that can potentially cause paralytic shellfish poisoning was also undertaken. In Manila Bay, algal blooms are periodic occurrences due to the incessant hyper-nutrient loading from domestic wastewater. Sampling stations were strategically chosen so that the stations are

evenly distributed throughout the length of the proposed reclamation site. Five (5) plankton sampling stations were employed during the survey. An assessment of meiofauna, soft-bottom organisms that are good indicators of pollution, was also undertaken in the same stations.

Even as it appears that the area is devoid of significant stocks of finfish due to turbid and predominantly poorly-oxygenated waters, rapid fisheries appraisal was undertaken through key informant interviews to determine (i) dominant fishing gears used in the study area, (ii) dominant catch composition, and (iii) estimated catch rates. The fisheries investigation was supplemented by actual fishing operations using a 500-meter bottom set gill net in three (3) stations.

Salinity measurements were also undertaken in the three actual fishing stations using a standard Atago refractometer.

The map of survey stations is shown in **Figure 2.2.60.**



Figure 2.2.60 Map of survey stations investigated during the baseline assessment and EIA in the proposed Pasay reclamation project, 13-14 August 2014

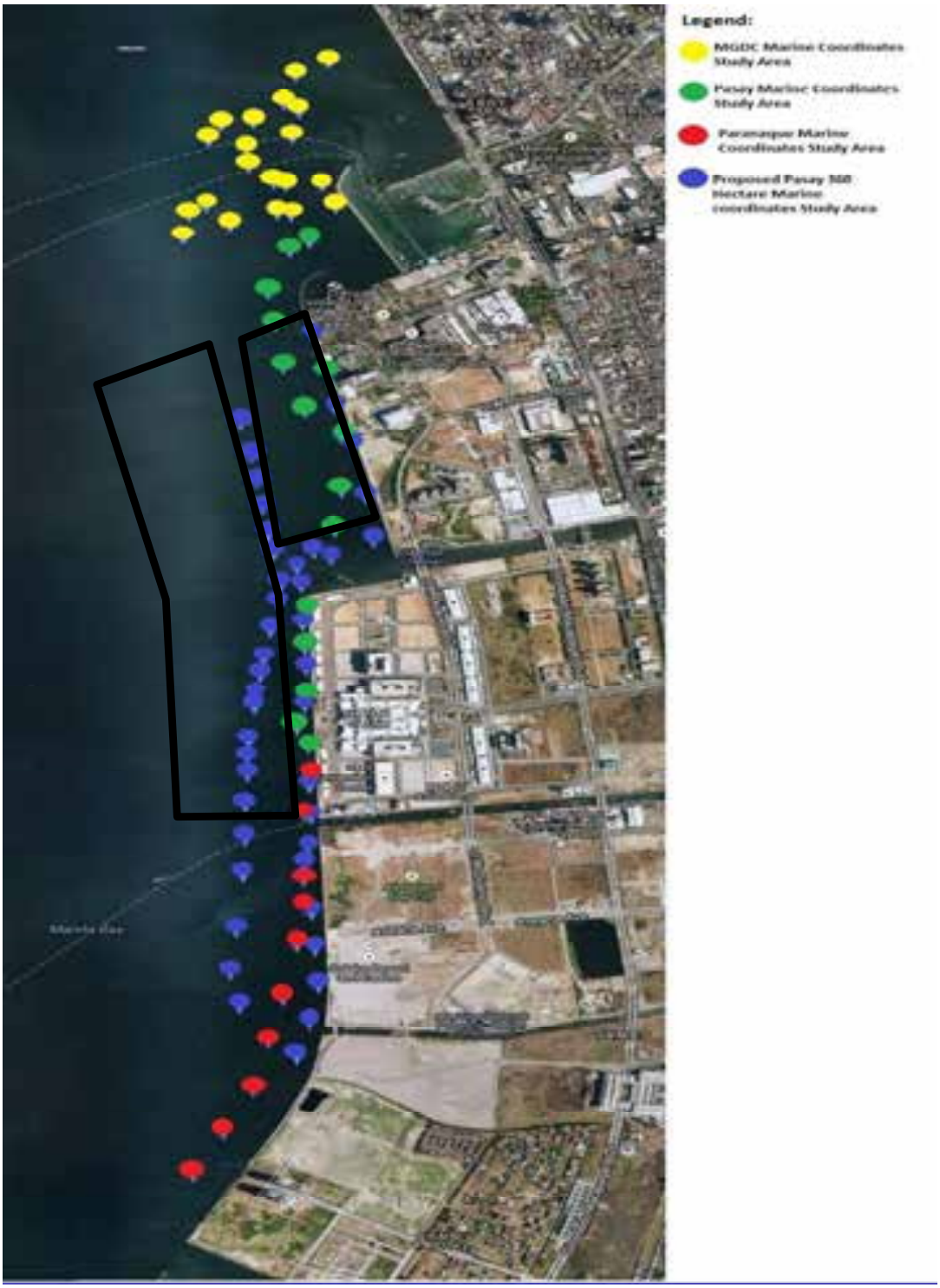


Figure 2.2.61 Baseline assessment map for MGDC, Paranaque and Pasay Reclamation Marine survey

Abundance/densities/distribution of ecologically and economically important species

Results of manta tow and spot dive assessments:

Manta tow assessments in forty-four pathways (**Figure 2.2.62** and **Table 2.2.7**) supplemented by systematic snorkeling in strategic points around the proposed reclamation site, and three spot dives (**Figure 2.2.63**) revealed the complete absence of any significant benthic community of corals, seagrass communities, natural or man-made fish shelters or artificial reefs, as well as occurrence of macro-invertebrates and macro-algae in all the stations surveyed. In all forty-four stations, silt and muddy substrate were observed (**Figure 2.2.64**). Except for epibenthic species that are resilient to pollution, the largely contaminated substrate, with silt and sediments constantly invading the seabed, is unfavorable to the settlement of benthic communities of marine animals and fauna.



Figure 2.2.62 Manta tow survey pathways investigated in the proposed Pasay 360 Hectare Reclamation Project on 13 August 2014

The benthic substrate of the area is comprised of mud, silt and sandy substrate mixed with fragments of broken shellfish carapace and bits of debris (**Plate 2.2.7**). The seabed is essentially barren and ecological functions are completely unremarkable, exacerbated by largely eutrophic conditions brought about by decaying sediments and extensive blankets of silt. Visibility in the water column was acutely turbid. Wave action and undercurrents forced back by the seawalls, constantly stirs up the bottom sediments such that water turbidity becomes even more pronounced during times of strong wave action. The absence of fishers and fishing gears, including set traps, stationary weirs and bivalve farms, also indicate that there is very little competing interests on a resource base that is ecologically impaired and cannot support stable and sustained existence of marine organisms or the settlement of macro-invertebrates. No mariculture structures were witnessed throughout the study area.



Figure 2.2.63. Map showing spot dive stations during EIA and baseline assessment for the proposed Pasay City 360 Hectare Reclamation Project

The muddy substrate, polluted water and turbid conditions are construed to have a significant negative impact on photosynthetic activity and marine food production, causing low dissolved oxygen content and highly unsuitable substrate for colonization or settling of benthic invertebrates, demersal species of fish, corals and seagrass recruits. It is not surprising therefore that the manta tow and spot dives did not encounter any biotic community of fundamental ecological value. Systematic snorkeling around key points in the proposed reclamation area also failed to witness presence of fish fry or juveniles.

The overwhelming silt and sediment load has also completely prevented the growth of seagrass and associated benthic macro-algae. Algal aggregates were found in unimpressive distribution only in the rocky seawall of a nearby mall. Validation through spot dives in areas suspected to have firmer substrate only further confirmed that seagrass resources were completely absent in the study area.

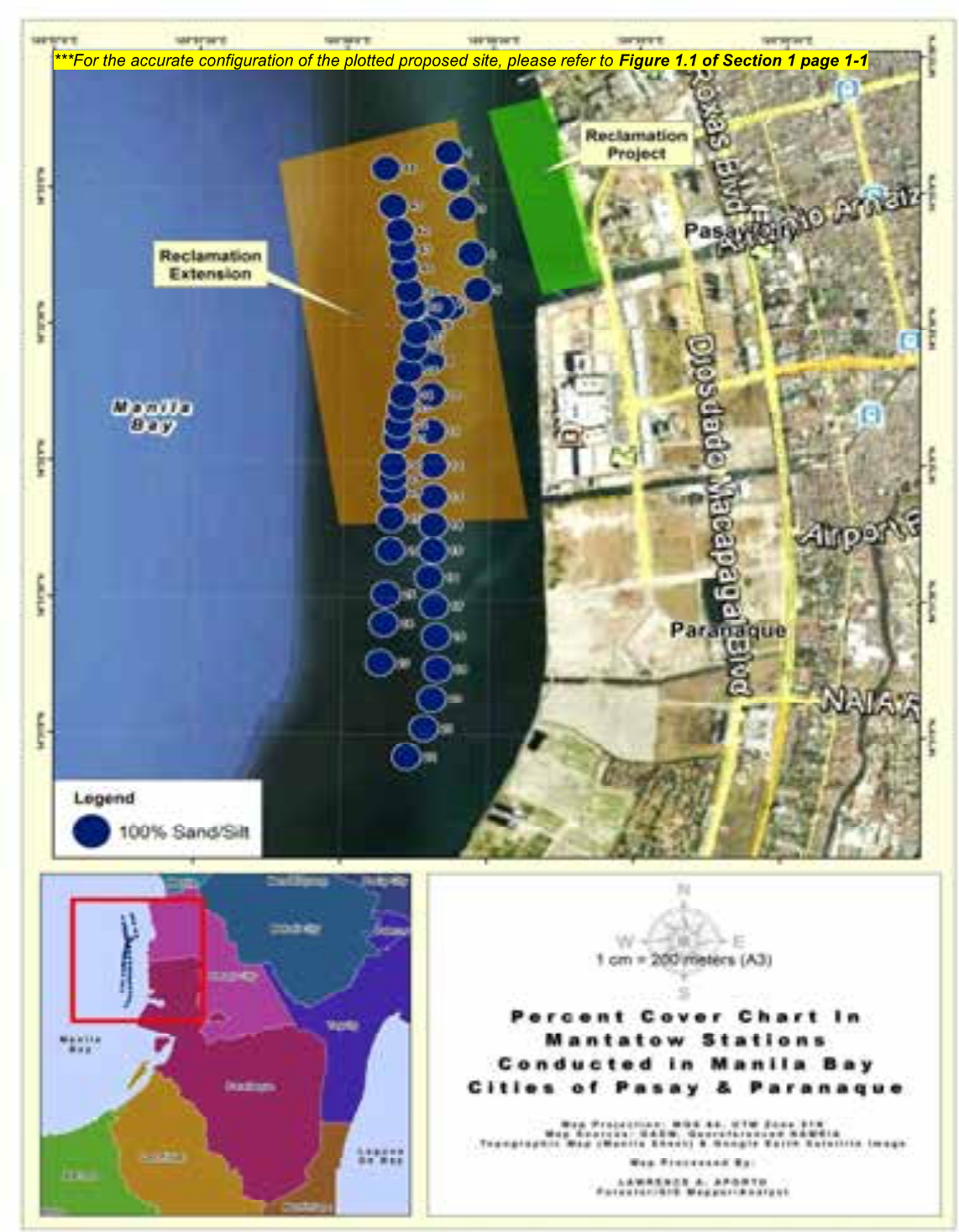


Figure 2.2.64. Result of manta tow surveys revealed silt and muddy substrate in all 44 stations and the absence of benthic life forms

Table 2.2.7 Manta tow stations surveyed during EIA in the proposed Pasay 360-Hectare Reclamation Project in 13 August 2014 (Observers: Vic Pantaleon, Ronald Pocon and Ernie Fontamillas)

Tow Number		Waypoints		Impressions	Remarks
		Latitude	*Longitude*	*Silt*	
1.	Start	N 14° 33' 15.0"	E 120° 58' 44.1"	100%	In front of Coconut Palace poor visibility
	End	N 14° 33' 08.1"	E 120° 58' 46.1"		
2.	Start	N 14° 33' 07.8"	E 120° 58' 46.1"	100%	Very poor visibility
	End	N 14° 33' 02.1"	E 120° 58' 47.4"		
3.	Start	N 14° 33' 01.6"	E 120° 58' 47.1"	100%	In front of Sofitel Hotel.
	End	N 14° 32' 55.7"	E 120° 58' 48.9"		
4.	Start	N 14° 32' 54.5"	E 120° 58' 49.4"	100%	Very poor visibility
	End	N 14° 32' 45.8"	E 120° 58' 51.0"		
5.	Start	N 14° 32' 45.0"	E 120° 58' 51.2"	100%	Very poor visibility
	End	N 14° 32' 37.9"	E 120° 58' 52.3"		
6.	Start	N 14° 32' 37.1"	E 120° 58' 52.2"	100%	Very poor visibility
	End	N 14° 32' 33.9"	E 120° 58' 46.8"		
7.	Start	N 14° 32' 33.7"	E 120° 58' 46.6"	100%	Very poor visibility
	End	N 14° 32' 34.0"	E 120° 58' 44.7"		
8.	Start	N 14° 32' 34.9"	E 120° 58' 44.3"	100%	In front of Viking Restaurant in SM-Mall of Asia, Pasay City, Metro Manila.
	End	N 14° 32' 29.1"	E 120° 58' 42.4"		
9.	Start	N 14° 32' 28.7"	E 120° 58' 42.5"	100%	Poor visibility (1 - 2 meters).
	End	N 14° 32' 22.0"	E 120° 58' 42.7"		
10.	Start	N 14° 32' 21.5"	E 120° 58' 42.7"	100%	In front of SM-Mall of Asia, Pasay City, Metro Manila with poor visibility (3 meters).
	End	N 14° 32' 14.7"	E 120° 58' 43.0"		
11.	Start	N 14° 32' 13.2"	E 120° 58' 43.2"	100%	Very poor visibility
	End	N 14° 32' 06.7"	E 120° 58' 43.0"		
12.	Start	N 14° 32' 06.2"	E 120° 58' 43.0"	100%	Very poor visibility
	End	N 14° 31' 59.1"	E 120° 58' 43.5"		
13.	Start	N 14° 31' 58.7"	E 120° 58' 43.5"	100%	Very poor visibility
	End	N 14° 31' 52.2"	E 120° 58' 43.6"		
14.	Start	N 14° 31' 51.5"	E 120° 58' 43.6"	100%	Very poor visibility
	End	N 14° 31' 46.1"	E 120° 58' 43.6"		
15.	Start	N 14° 31' 45.8"	E 120° 58' 43.8"	100%	Very poor visibility
	End	N 14° 31' 40.5"	E 120° 58' 43.6"		
16.	Start	N 14° 31' 40.0"	E 120° 58' 43.5"	100%	Very poor visibility
	End	N 14° 31' 34.5"	E 120° 58' 42.9"		
17.	Start	N 14° 31' 34.3"	E 120° 58' 42.9"	100%	In front of Solaire Hotel, Pasay City, Metro Manila with poor visibility .
	End	N 14° 31' 28.2"	E 120° 58' 44.0"		
18.	Start	N 14° 31' 27.9"	E 120° 58' 44.0"	100%	Very poor visibility
	End	N 14° 31' 21.6"	E 120° 58' 44.4"		
19.	Start	N 14° 31' 21.3"	E 120° 58' 44.4"	100%	Near the mouth of Parañaque River with poor visibility (1 meter).
	End	N 14° 31' 14.4"	E 120° 58' 44.8"		

Tow Number		Waypoints		Impressions	Remarks
		Latitude	*Longitude*	*Silt*	
20.	Start	N 14° 31' 14.4"	E 120° 58' 44.8"	100%	Very poor visibility
	End	N 14° 31' 07.8"	E 120° 58' 43.7"		
21.	Start	N 14° 31' 07.5"	E 120° 58' 43.6"	100%	Very poor visibility
	End	N 14° 31' 01.3"	E 120° 58' 42.1"		
22.	Start	N 14° 31' 01.0"	E 120° 58' 42.0"	100%	Very poor visibility
	End	N 14° 30' 55.0"	E 120° 58' 38.6"		
23.	Start	N 14° 31' 10.4"	E 120° 58' 34.2"	100%	Very poor visibility
	End	N 14° 31' 15.7"	E 120° 58' 33.0"		
24.	Start	N 14° 31' 16.8"	E 120° 58' 33.0"	100%	Very poor visibility
	End	N 14° 31' 24.3"	E 120° 58' 33.7"		
25.	Start	N 14° 31' 24.6"	E 120° 58' 33.8"	100%	Very poor visibility
	End	N 14° 31' 30.7"	E 120° 58' 34.1"		
26.	Start	N 14° 31' 35.0"	E 120° 58' 34.7"	100%	Very poor visibility
	End	N 14° 31' 40.4"	E 120° 58' 34.9"		
27.	Start	N 14° 31' 41.5"	E 120° 58' 34.9"	100%	Very poor visibility
	End	N 14° 31' 47.4"	E 120° 58' 35.0"		
28.	Start	N 14° 31' 47.8"	E 120° 58' 35.0"	100%	Very poor visibility
	End	N 14° 31' 53.2"	E 120° 58' 35.4"		
29.	Start	N 14° 31' 53.6"	E 120° 58' 35.3"	100%	Very poor visibility
	End	N 14° 31' 56.3"	E 120° 58' 35.3"		
30.	Start	N 14° 31' 56.7"	E 120° 58' 35.3"	100%	Very poor visibility
	End	N 14° 31' 59.2"	E 120° 58' 35.3"		
31.	Start	N 14° 31' 59.7"	E 120° 58' 35.4"	100%	Very poor visibility
	End	N 14° 32' 05.1"	E 120° 58' 36.1"		
32.	Start	N 14° 32' 05.9"	E 120° 58' 36.2"	100%	Very poor visibility
	End	N 14° 32' 08.1"	E 120° 58' 36.3"		
33.	Start	N 14° 32' 08.5"	E 120° 58' 36.4"	100%	Very poor visibility
	End	N 14° 32' 11.6"	E 120° 58' 36.9"		
34.	Start	N 14° 32' 12.0"	E 120° 58' 37.0"	100%	Very poor visibility
	End	N 14° 32' 14.6"	E 120° 58' 37.3"		
35.	Start	N 14° 32' 15.0"	E 120° 58' 37.4"	100%	Very poor visibility
	End	N 14° 32' 20.0"	E 120° 58' 38.3"		
36.	Start	N 14° 32' 20.3"	E 120° 58' 38.4"	100%	Very poor visibility
	End	N 14° 32' 24.7"	E 120° 58' 39.2"		
37.	Start	N 14° 32' 25.3"	E 120° 58' 39.4"	100%	Very poor visibility
	End	N 14° 32' 28.3"	E 120° 58' 39.9"		
38.	Start	N 14° 32' 28.8"	E 120° 58' 39.8"	100%	Very poor visibility
	End	N 14° 32' 34.0"	E 120° 58' 38.9"		
39.	Start	N 14° 32' 34.6"	E 120° 58' 38.8"	100%	Very poor visibility
	End	N 14° 32' 37.5"	E 120° 58' 38.2"		
40.	Start	N 14° 32' 38.1"	E 120° 58' 38.0"	100%	Very poor visibility
	End	N 14° 32' 42.5"	E 120° 58' 37.2"		

Tow Number		Waypoints		Impressions	Remarks
		Latitude	*Longitude*	*Silt*	
41.	Start	N 14° 32' 42.9"	E 120° 58' 37.3"	100%	Very poor visibility
	End	N 14° 32' 46.7"	E 120° 58' 36.8"		
42.	Start	N 14° 32' 47.8"	E 120° 58' 36.5"	100%	Very poor visibility
	End	N 14° 32' 50.7"	E 120° 58' 36.2"		
43.	Start	N 14° 32' 52.4"	E 120° 58' 35.7"	100%	Very poor visibility
	End	N 14° 32' 56.2"	E 120° 58' 34.8"		
44.	Start	N 14° 32' 58.6"	E 120° 58' 34.3"	100%	Very poor visibility.
	End	N 14° 33' 04.5"	E 120° 58' 33.3\\"		

Plate 2.2.7 (Left) Survey diver in collecting silt substrate and water samples during spot dive; silt, sand, mud and bits of shellfish carapace comprise the seafloor in the study area.



Fish and fisheries

The spot dives and sub-surface snorkeling surveys yielded no encounters with sizeable fish communities except for a few sightings of Tilapia and small Glassfish. In the rocky seawall of the SM Mall of Asia, a few pelagic species of needlefish (*Tylosorus leiurus*), a lone theraponid, *Pelates quadrilineatus (*Bagaong) and a lone, juvenile specimen of the soldierfish *Saurida Tumbil (*Kalaso) were the only species encountered, presumably seeking grazing grounds amongst the rocks. *No fishermen were encountered in two days of surveys*. The absence of viable fisheries resources is an offshoot of largely unproductive conditions and the complete lack of suitable habitats where growth, maturation and reproductive processes can take place.

Three actual fishing stations were undertaken using a 500-meter bottom set gill net with setting time averaging 1 hour per station. The gill net was set only once in each station. The catch and CPUE - is insignificant. The result of test fishing further confirms findings from manta tow surveys and systematic snorkeling indicating the absence of significant fisheries resources in the area. However, key informants claim that that they catch an average of 3 to 5 kg of Tilapia in fishing

grounds about one kilometer from the seawalls. Tilapia has acclimatized in the saline waters of the Bay and is in fact extensively caught in Bacoor Bay through the use of lift nets and gill nets. Compared to the sizeable presence of this species in Bacoor Bay as indicated in daily catch landings in Brgy. Siniguelasan, Bacoor, the Tilapias that somehow move closer to the shores in the study site are relatively few. Key informants also claim that occasional hook and line fishers operate in the area for subsistence. Catch rates are extremely low at less than one kilo per day and does not therefore indicate viable productivity for fisheries livelihoods.



Figure 2.2.65 Sites of actual fishing operations undertaken during EIA for the proposed 360-hectare reclamation project in Pasay City

Key informants further allege that only lift nets, gill nets and a few hook and line fishers operate in the fishing grounds farther from the reclamation site. The lift nets can be found some 2.5 to 3 kilometers southwest of the site, starting in upper Paranaque and becoming denser in Bacoor, Cavite. In the offshore fishing areas, lift nets and gill nets catch anchovies (Dilis), round scad (Galungong), ponyfishes (Sap-sap) and the common whiting (*Sillago sihama*; *asohos)*.

The survey also encountered two fish vendors selling Tilapia and milkfish in the sidewalks near the seawall beside the Manila Yacht Club (extreme right picture in **Plate 2.2.8**). The vendors claim that fish are caught by fishers in the coastal waters of Manila Bay close to the seawalls of the SM Mall of Asia. An average of 4 to 5 kilograms of Tilapia is allegedly caught by fishers using gill nets. Results from test fishing operations during the survey, however, indicates that the presence of Tilapias are not extensive in the shallow waters within proposed project site but occur in greater abundance towards the Paranaque-Bacoor area where lift nets and mussel farms are situated. Lift nets in Parananque-Bacoor allegedly harvest Tilapia, along with sardines and slipmouths, at an average of 12 to 20 kg per night.

Plate 2.2.8 Actual fishing operations in the proposed 360-hectare reclamation project (left), a lone Sardine fish caught in Station 3, and fish vendor selling Tilapia allegedly caught one kilometer from the seawalls.



Macro-invertebrates

No macro-invertebrates, even species of epibenthic behavior, were encountered in spot dives and manta tow surveys. Snorkeling near the shoreline only revealed the presence of immature and isolated appearances of bivalves consisting of mussels and oysters. In the seafloor, remains of dead seashells have been observed in samples of substrate collected. The dead shells and shellfish carapace are believed to have spilled over from land fillings of previous reclamation projects.

Macro-invertebrates were only found in the crevices of the rocky seawall facing the Mall of Asia. Only four species were encountered in 3 hours of investigations. These consisted of the gastropod nerit shell *(Nerita sp),* a rock oyster *Isognomon ephipium,* green mussels *Perna viridis*, and a fiddler crab *Uca sp*.

Plate 2.2.9 Few macro-invertebrate species encountered during the marine EIA survey for the proposed Pasay reclamation expansion project, August 2014



Plankton

Phytoplankton

Composition, abundance and density of phytoplankton communities was determined using standard methodologies, including plankton net surveys, Shannon-Weaver Diversity/Evenness Indices and bio-assessment metrics. Identification of phytoplankton species that can enrich to become harmful algal blooms that can potentially cause paralytic shellfish poisoning was undertaken. The plankton stations are depicted in **Figure 2.2.66**.

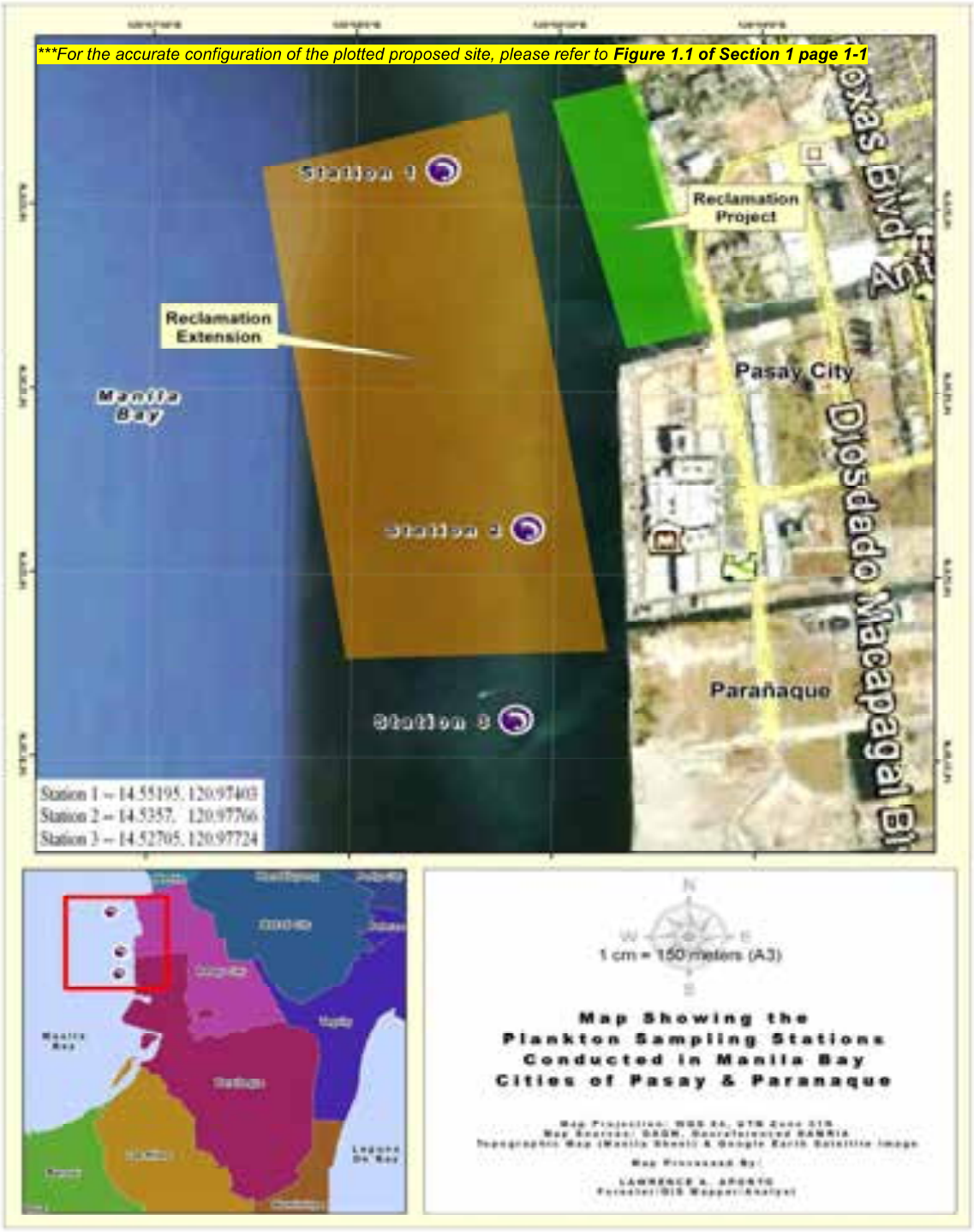


Figure 2.2.66. Map of stations where plankton community surveys were undertaken in the proposed 360-hectare reclamation project in Pasay City (researcher: Garry Benico)

Phytoplankton species found in the proposed 360-hectare reclamation project are comprised of species typically found in tropical marine environment. A total of 11 phytoplankters were found belonging to *Cyanophyta* (blue green algae) with one species, *Bacilliarophyta* (diatoms) with three species, *Pyrrophyta* (dinoflagellates) with six species and *Silicoflagellate* with only one species. The most number of phytoplanktons were encountered in water samples taken from Station 1. Dinoflagellates were the most abundant and diverse in three sampling stations but the most dominant genera were from the diatoms group. In fact a nontoxic high biomass bloom of a centric diatom, *Skeletonemacostatum* was documented during the sampling period with maximum cell density of 2.8 x 10^6 cells/L (**Table 2.2.6**). Dense numbers of the *Skeletonema costatum* was found in all three stations surveyed. The bloom of this microalgal species caused the reddish brown water discoloration. This species dominated the phytoplankton community accounting for 99% of the total abundance. For this reason, diversity and evenness measurements are very low due to dominance of this single species. Some studies have already demonstrated that cell densities going over 10^5 cells/L is already considered eutrophic (Kitsiou and Karydis, 2001; Kitsiou and Karydis, 2002). This data showed cell density of *Skeletonema costatum* have even reached to 10^6S. In many instances, empirical evidence from typical "red tide" occurrences in marine bodies of water reveals that such algal blooms can be followed by algal die-off that triggers oxygen depletion in the water column where tidal flushing is weak. The resultant anaerobic condition in turn causes what is popularly known as "fish kills".

Table 2.2.8 Phytoplankton composition and abundance represented in number of cells/L in three (3) stations collected in the proposed 36-hectare reclamation project in Pasay City, Manila Bay; August 2014.

TAXA	STATIONS			Grand
	ST1	ST2	ST3	Total
Cyanophyte	**50**	**2**	**5**	**57**
Trichodesmium	50	2	5	57
Diatoms	**1,817,840**	**2,881,026**	**2,089,998**	**6,788,864**
Pseudonitzschia	109	6,595	4,246	10,949
Skeletonema costatum	1,804,671	2,845,011	2,061,217	6,710,899
Thalassiosira	13,061	29,421	24,534	67,015
Dinoflagellate	**2,154**	**42**	**42**	**2,239**
Ceratium furca	1,967	19	9	1,996
Ceratium fusus	57		7	64
Dinophysis caudata	52	19	14	85
Prorocentrum micans	12			12
Protoperidinium conicum	24			24
Protoperidnium spp	42	5	12	59
Silicoflagellate	**6**		**1**	**6**
Tintinids	6		1	6
Grand Total	**1,820,049**	**2,881,071**	**2,090,046**	**6,791,165**
Mean abundance	**165,459**	**411,582**	**232,227**	
Species Richness	**11**	**7**	**9**	
Evenness	**0.02**	**0.04**	**0.04**	
Diversity	**0.05**	**0.07**	**0.08**	

Plankton communities can be impacted negatively by the proposed reclamation project when sediment plumes potentially triggered by the reclamation works add to extreme water turbidity. The reduced sunlight penetration in the water column suppresses photosynthetic extent, normally performed by phytoplankton organisms in the lower base of the marine food chain. However, the disruption in the level of photosynthesis will be temporary and localized as planktons simply recolonize in other portions of the sea and will also resume normal growth and multiplication when sediments settle after project establishment. It is not anticipated that impairment of primary productivity will be persistent and of long-term duration.

Plate 2.2.10 Water discoloration encountered during marine survey in the proposed 360-hectare Pasay reclamation project indicate algal bloom typically occurring in Manila Bay where hyper-nutrient loading causes massive phytoplankton multiplication, in effect in causing discoloration of the water column



Zooplankton

A total of five zooplankton group were found in three stations during the August 2014 sampling period in the proposed 360-hectare reclamation project in Manila Bay. Zooplankton taxa identified include adult forms of copepod (calanoid and cyclopoid), larval forms of bivalve and nauplius and a microzooplankton, *Favell*a *sp*. The lowest zooplankton density were found within station 3 with 24,770 ind/m^3 while the highest is found in station 1 with 42,463ind/m^3 while. The high zooplankton group densities are presumed to have been triggered by high availability of food due to the rich phytoplankton biomass. Cyclopoid copepod dominated in station 1 and 3 while the nauplius dominated in station 2.

The presence of free-swimming bivalve veligers is presumed to originate from the mussel and oyster farms in Bacoor, Cavite. Despite their presence in significant numbers, it is evident from the surveys conducted that the bivalves do not settle in the study area.

Table 2.2.9 Zooplankton composition abundance at ind/m^3 3 stations Manila Bay, Paranaque area during the August 2014 sampling

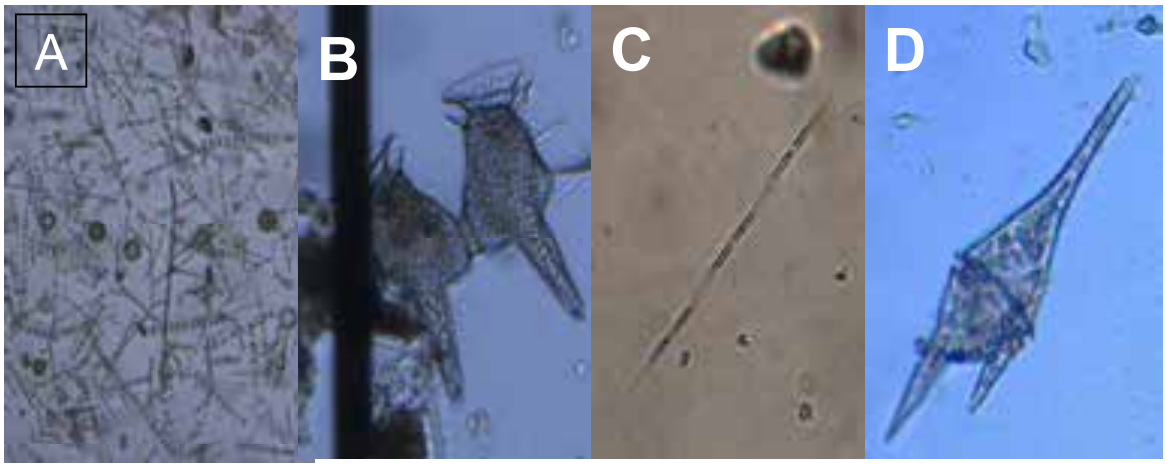
TAXA	STATIONS			Grand
	ST1	ST2	ST3	TOTAL
Bivalve veliger	8,493	6,369	0	14,862
Calanoid	3,539	1,415	2,831	7,785
Cyclopoid	23,355	5,662	4,246	33,263
Favella	4,246	3,539	1,415	9,200
Nauplius	2,831	7,785	3,539	14,154
Grand Total	**42,463**	**24,770**	**12,031**	**79,264**

Historical occurrences of red-tide, fish kill or any related event

Records show that the occurrence of harmful algal blooms (HABs) in the Philippines has been associated with the onset of the southwest monsoon but there has been very little evidence attributing extensive siltation as a primary and sudden trigger of HABs. In many cases, increased nutrient loading through sediment transport has been observed to be a more likely pathway for occurrence of HABs in coastal areas if the suspended organic matter (OM) causes hyper-nutrient levels and euthrophication. The pollution of coastal waters is believed to stimulate bursts in populations of microscopic and macroscopic algae as various pollution-supplied substances fertilize the water column and bottom substrate and provide the nutrients that trigger algal bloom proportions. Because of this, harmful or toxic algal species become more abundant and more noticeable.

Several studies have already shown that Manila Bay waters are eutrophic. Chang et al (2006) reported that high nitrogen concentration particularly ammnonia observed in Manila Bay is an indication that this body of water is already eutrophic. Episodic hypoxia and phytoplankton blooms, phenomena that occur in Manila Bay, are manifestations of eutrophication (Jacinto et al 2006). Manila Bay has a long history of toxic algal bloom particularly the armored, chain forming dinoflagellate *Pyrodiniumbahamense* (Azanza et al 2004) resulting to several paralytic shellfish poisoning cases and deaths in Cavite and Bataan in the 90s. From early 2000 until now, this species has never been found to cause a toxic bloom again but poisoning cases and death reported in Bataan, in the western side of Manila Bay in 2011, 2012 and 2013 were due to the blooms of another dinoflagellate, *Alexandrium spp* (Benico et al 2014). These two toxic species were not found in samples analyzed but other toxic and potentially harmful species has been observed in the water samples. These include *Dinophysis caudata*, *Pseudonitzchia spp* and *Ceratiumfurca* (**Plate 2.2.11**). *Dinophysiscaudata* is known to produce okadaic acid associated with diarrhetic shellfish poisoning while there are some species of *Pseudonitzchia* that are reported to produce domoic acid, a toxin associated with amnesic shellfish poisoning. *Ceratiumfurca* has been associated with events of fish kills due to high- density microalgal bloom. However, these types of poisonings caused by blooms of these species have never been reported as yet in Manila Bay except PSP. Nevertheless PSP is regarded as the most risky to consumers of shellfish in Manila bay and causes huge economic losses to shellfish farmers in Bacoor Bay.

Plate 2.2.11. Photomicrograph of dominant and potentially harmful phytoplankton in Manila Bay Paranaque area during the August 13, 2014 sampling (A) *Skeletonemacostatum* (B) Dinophysis caudata (C) P*seudonitzschia*sp (D) *Ceratiumfurca*



Meiofauna

Meiofaunal communities are extremely sensitive to eutrophication and hypoxia, and have been used in several studies as indicators of organic enrichment (Grall and Chauvaud, 2002). Surveys were undertaken using core sampling in three stations in the proposed 360-hectare reclamation project in Pasay City, Manila Bay (**Figure 2.2.67**).

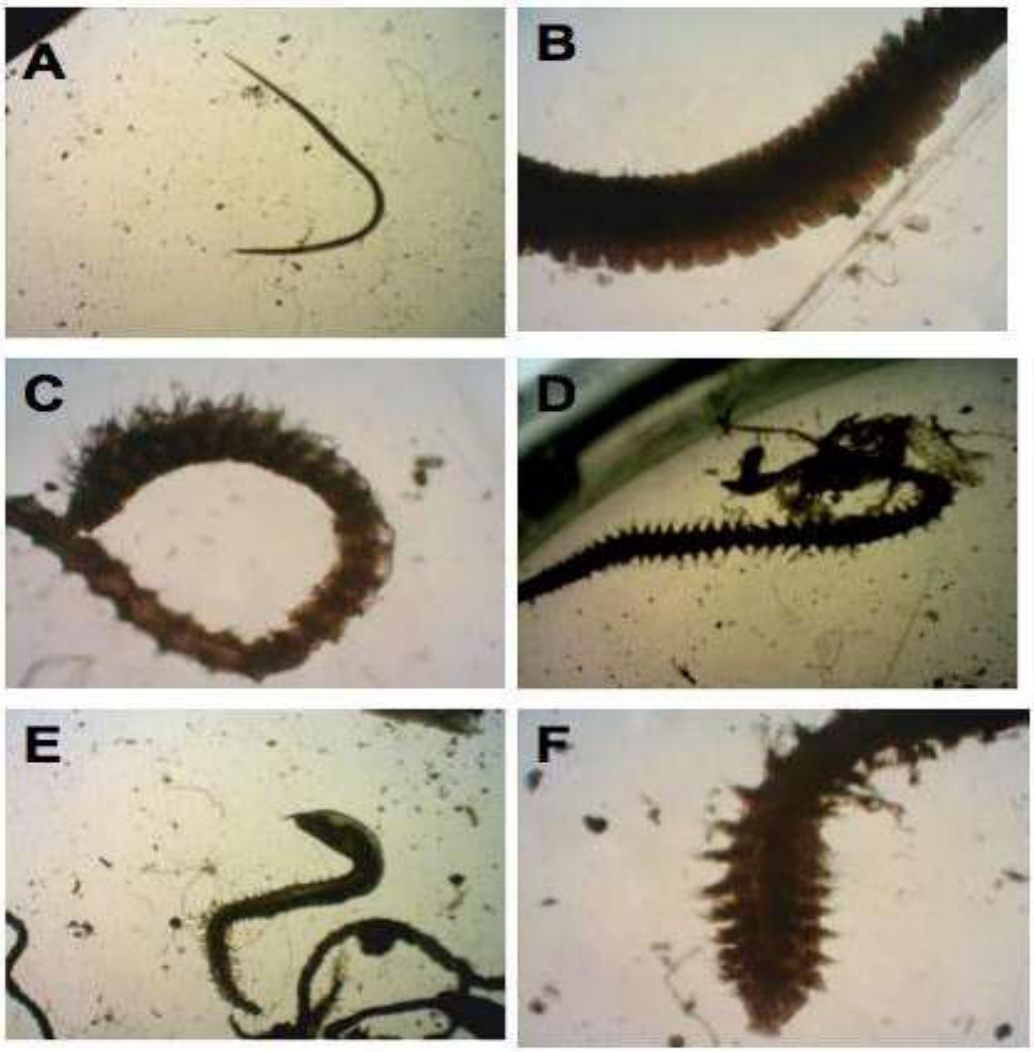
Meiofaunal groups observed in sediment samples analyzed from three sampling stations belong to the group of Polychaete, Nematodes and Oligochaetes. Among them, polychaetes were the most abundant group particularly in station 1 and 2. Polychaetes have been shown to be an opportunistic species that are able to thrive after an increase in organic matter and thus play an important role as indicators of pollution-impacted soft bottom habitats (Giangrande et al 2005). In terms of species richness, only few five species of polychaetes were found and two species of nematodes with counts ranging from 5-7 ind/ml. Nematodes is an indicator for assessing the ecological quality of marine ecosystem (Semprucci et al 2013). In this survey, nematodes were found in two stations but at very low abundance. Occurrence of these groups however could be indicative of stressed environment that are typically found to be inhabited by such highly pollution-tolerant species. Commercially important or edible benthic macrofaunal species were not found during the survey period. Overall, the result of meiofaunal survey showed the benthic community habitat is already disturbed indicated by the presence of groups tolerant to marine pollution and organic loading.

****For the accurate configuration of the plotted proposed site, please refer to **Figure 1.1 of Section 1 page 1-1***



Figure 2.2.67 Map of core sampling sites in the proposed 360-hectare reclamation project in Manila Bay for meiofauna assessment (Researcher: Garry Benico)

Plate 2.2.12. Photomicrograph of benthic meiofauna in three station in Manila Bay area during the August 2014 sampling in the proposed 360-hectare reclamation project: (A) Nematode (B-F) Polychaetes



Presence of pollution indicator species

Phytoplankton's are microscopic plant organisms that form the base of the aquatic food chain, providing higher forms of life their source of food. As primary producers, they are critical in the transfer of energy from one trophic level to the next and as such are valuable indicators of ecosystem health. Having brief life spans and rapid reproduction rates, they are among the first to respond to environmental perturbations making them ideal indicators of short-term environmental conditions and impacts. At least three species of toxic and potentially harmful phytoplankton species were observed in the water samples collected in three stations in the proposed 360-hectare Manila Bay reclamation Project. These include *Dinophysis caudata*, *Pseudonitzchia spp* and *Ceratiumfurca. Dynophysis cordata* is attributed to the occurrence of biotoxin that cause diarrhetic shellfish poisoning while some species of *Pseudonitzchia* are reported to produce domoic acid, a toxin associated with amnesic shellfish poisoning. The

species of dinoflagellate *Ceratiumfurca,* numbering 2000 cells per liter in water samples collected from Station 1 has been associated with events of fish kills due to high- density micro-algal bloom.

Filter-feeding bivalves in the Bacoor area are prone to episodes of Red Tide that can cause paralytic shellfish poisoning in humans, when consumed during episodes of algal blooms. Manila Bay has been under constant threat of such algal blooms and red tide monitoring in the area is a standard and precautionary activity undertaken by the Bureau of Fisheries and Aquatic Resources. However, mussels and oysters are not present in the proposed reclamation site. The mussel farms in the Bacoor area are, however, too far from the project site and issues potential emanating from the project is unlikely to affect the mussel and oyster industry in the Bay. Moreover, the Project is not expected to contribute to further nutrient loading during its operation phase as state-of-the-art wastewater treatment facilities will be established.

Marine fish species have not been used as indicators of pollution, except where biotixins are involved (e.g. plankton-filtering fish species in PSP-affected areas such as Anchovies). However, the survey did not encounter significant fish populations in the coastal waters fronting the project site that can be considered indicators of pollution.

2.2.5.1 Threat to existence and/or loss of important local species and habitat

Substrate disturbance, silt plumes arising from reclamation area filling are expected to have short term impacts on ecosystem modification in an area where the coastal environment is already heavily impaired by pollution, eutrophic episodes, and absence of benthic ecological structures and functions. Reclamation activities will further contribute to turbidity and dispersal of silt plumes will further impair photosynthesis in the water column but this will be temporary and would not have far reaching impacts on benthic life forms or fishing practices in the area and its contiguous environs. The negative impacts will have little effect on fish reproductive functions as there are no significant fish populations of maturing size in the area owing to the absence of suitable settlement and habitats for reproduction and recruitment. The few species and numbers of mollusks and fishes dwelling in isolation in the rocky seawall will be displaced but resettlement can occur in deeper waters and farther from the mouth of channels and sewage outlets. Episodes of HAB-causing phytoplankton blooms are already a periodic consequence of hyper-nutrient loading in the area and the project operation will not have an incremental effect to this phenomenon.

Potential Threat during Navigation to/from site to San Nicholas Shoal in Cavite

A survey was made to establish the presence of stationary fishing gears which may be along the navigation path of the dredging vessel and thus could be subject to damage in case of accidents.

Table 2.2.10 The survey pathway

Station number and description	Coordinates	Notes
1-Starting point	N 14 27 47.9	Bgy Siniguelasan, Bacoor
	E 120 55 56.1	
2-sangley point cavite bend	N 14 30 04.4	
	E 120 55 03.2	
3-san Antonio going towards shoal;	N 14 30 07.2	
	E 120 54 16.0	
4- end; Manila Yacht Club	N 14 33.012	
	E 120 56.775	

Presence of stationary fishing gears were observed; however, there are no fish pens in the outer seas, but only inside Bacoor Bay and boundary with Paranaque. The fishing gears encountered are called "Sapra" or lift nets that are lighted at night, lifted every 3 to 4 hours for the capture of mostly Tilapia, Ponyfish, Anchovies and Sardines. A total of 12 of these structures in the sea were encountered, shown in **Table 2.2.11** and in **Figure 2.2.68.** These are located in the outer, deeper waters.

Table 2.2.11 Inventory of Lift Nets between Reclamation Site and San Nicholas Shoal

Lift Net No.	Coordinates
1	N 14°31.009
	E 120°55
2	N 14°30.936
	E 120°55.930
3	N 14°30.854
	E 120°56.247
4	N 14°31.042
	E 120°56.060
5	N 14°31.037
	E 120°56.296
6	N 14°31. 210
	E 120°56. 291
7	N 14°31. 389
	E 120°56.300
8	N 14°31.545
	E 120°56. 422
9	N 14°31. 291
	E 120°56.461
10	N 14°31.240
	E 120°56.702
11	N 14°31.178
	E 120°57.261
12	N 14°31. 197
	E 120°57.480



Figure 2.2.68 Location of the Lift Nets Relative to the Anticipated Navigational Lane of the Dredging Vessel

Photo Documentation of the Survey

Plate 2.2.13 Survey boat in Bgy. Siniguelasan, Bacoor City



Plate 2.2.14 Oyster stakes in Bacoor Bay



Plate 2.2.15 Lift nets ("Sapra") and mussel stakes in outer Bacoor Bay



There are no more fishing structures at this point and all throughout the navigational lane going to San Nicolas shoal

Plate 2.2.16 Brgy San Antonio in Cavite City



Plate 2.2.17 The lift net line in the outer rim, deeper waters



Plate 2.2.18 Other lift nets



Major Conclusions

It may be concluded from the above survey that:

- The fish pens and/or lift nets are distant from the project site;
- These are located near the Bacoor area in Cavite;
- These need to be taken into account when planning for the navigational route of the dredging vessel that will cruise from project site to San Nicholas and back;

Simple preventive measures that will be observed are:

- Avoidance of possible damage to the fish pens/lift nets by choosing navigational lane distant from these pens/lift nets.
- Strict observance of the protocol/requirements of the Philippine Coast Guard such as “no shipping/travel” policy during inclement weather conditions.

Further and recent verification of significant fishing activities within the reclamation project

Actual survey was made on 19 August 2016 to reconfirm fishing activities within the reclamation area whereby the following observations were made.

Survey area

This is shown in **Figure 2.2.69.**

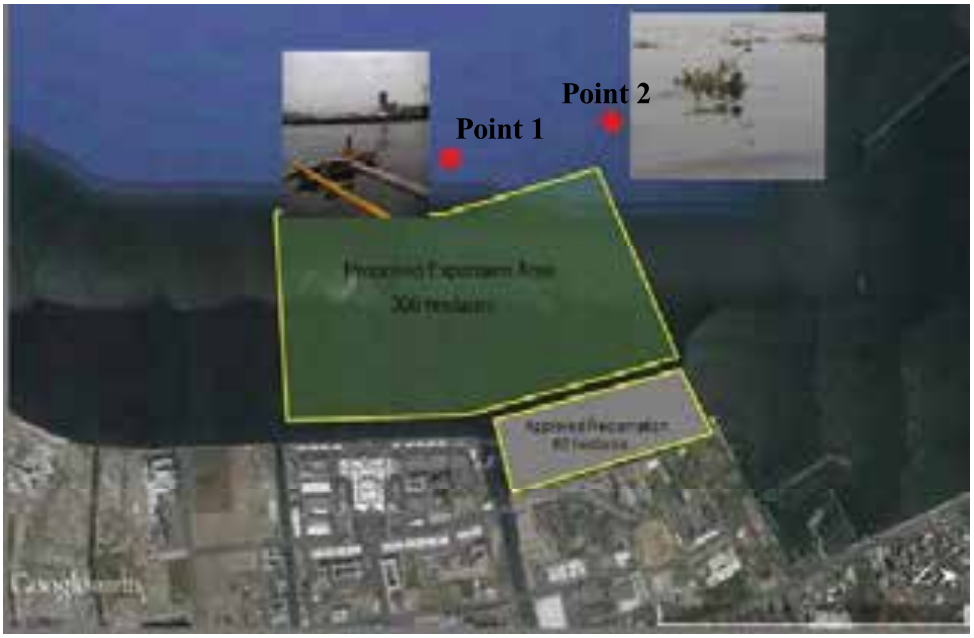


Figure 2.2.69 The Fishing Survey Map

Point 1 - Fishing area offshore for hook and line
N 14.539929°
E 120.962885°

Point 2 – Fishing ground offshore for hook and line
N 14.549615°
E 120.960727

Photographs of the fishing activities

Plate 2.2.19
Only two fishermen with paddle boats were seen during the survey conducted on 19 August 2016. Both were fishing for Tilapia. Both claimed that the fishing grounds for hook and line was further offshore – "in the middle, where the ships are parked at bay"



Plate 2.2.20
Another fisher was collecting or "as they said "salvaging" for mussels which allegedly drifted from mussel farms in Cavite. These mussels are few in count



Plate 2.2.21
The closest major fishing ground of hook and line fishers from the Libertad Channel are located more than two kilometers from the seawalls. Fishers point to areas near "parked" ships



Survey of Fishing Grounds in Manila Bay Near Libertad Channel
20 August 2016

Information from key respondent and fishers interviewed

1. The nearest fishing grounds offshore are outside the boundary of the 360-hectare reclamation project. Many fore fishing grounds are located farther offshore, about 3 kilometers away from seawall.

2. Reclamation area is seldom fished due to "no more fish in nearshore, shallow area near seawalls" (from fisherman interviewed).

3. Offshore fishing grounds are for hook and line, the catch are small *Talakitok, Bugaong* and *Bid-bid*; the catch is small, averaging 1 kilogram per day
4. The coordinates in the attached map are for the following:

2.2.5.2 Threat to abundance, frequency and distribution of marine species

Owing to the absence of benthic life forms and marine species of fish, the proposed reclamation project poses insignificant threats to the few organisms encountered in the area at the time of the survey or permanent disturbance to the largely silted, soft-bottom substrate.

Increased nutrient loading through sediment transport can be a likely pathway for occurrence of HABs in coastal areas if the suspended organic matter (OM) disturbed and re-suspended by reclamation piling causes hyper-nutrient levels and euthrophication. The pollution of coastal waters is believed to stimulate bursts in populations of microscopic and macroscopic algae as various pollution-supplied substances fertilize the water column and bottom substrate and provide the nutrients that trigger algal bloom proportions. Because of this, harmful or toxic algal species become more abundant and more noticeable. Currently, the densities of plankton groups observed in the coastal area within the vicinity of the project site already indicate the occurrence of HABs attributed to the species *Skeletonema costatum*. While this species has not been associated with paralytic shellfish poisoning in Manila Bay, the frequent bloom of this species can trigger fish kills due to oxygen depletion normally consequential to algal die-off. The project is not expected to contribute to further nutrient loading during operation stage and it is unlikely therefore that the project can exacerbate such phenomena. Meiofauna can be suffocated by physical alteration of the substrate during reclamation. This will cause dislocation of these organisms but it is anticipated that the nematodes and polychate worms can easily re-colonize elsewhere.

The stationary lift nets, mussel stakes and oyster beds are too from the proposed project site and will not be impacted by sediment plumes from the project site. Schools of Tilapia, anchovies, mackerels and ponyfishes are not found in significant numbers in the site and will not be affected. Such pelagic species of fish will simply evade polluted waters and seek grazing grounds farther away from the reclamation site. On the contrary, it can be foreseen that the new breakwater to be subsequently established by the reclamation project, in deeper water with lesser polluted waters, can eventually become more favorable habitats for such species.

2.2.6 Circulation / plume modeling (include worst case scenario of failure of WTF and other emergency/accident scenarios).

This is discussed in **Section 2.2.3.** The reclamation phase of the project will not involve a Waste Treatment Facility (WTF).

2.2.7 Aquifer (Groundwater) vulnerability Assessment (ie. discussions on groundwater contamination due to project operation) or groundwater contamination modeling

The reclamation will not involve extraction of groundwater and neither will there be activities that will disturb, damage and impact on the groundwater.

2.2.8 Discussions on possible contamination due to leaks/spills

These are made in Impact Management Plan **Section 3.1.10.9.**

2.2.9 Benefits of the reclamation to the "Ecology" of Manila Bay

The benefits are greater appreciated when comparing the "Without" and the "With" the Project Scenarios

In a "Without the Project" Scenario –

The establishments, buildings, etc. will instead be located on land and most probably on several sites. Management and mitigation of waste water discharges will be relatively much more difficult and hence the impacts on the ecology could be greater.

In a "With" the Project Scenario-

The various SDP and CSR plans would include commitments to enhancement of the Manila Bay as well as to other programs outlined in the Manila Coastal Bay Strategy.

Portion of the reclaimed land will be for the use of the government units; hence the "Mandamus" will extend to a greater number of government offices.

In addition –

- The establishment of modern wastewater treatment facilities within the reclamation project will help to reduce marine pollution. The Project will also result to reduction of solid wastes in the shoreline as the reclamation project will adopt extensive measures to improve shoreline amenity, appeal and cleanliness.

- Project proponent will support campaigns for better water quality management and reduction of marine pollution in the area as this will benefit the reclamation project over the long term. The Project will also support efforts to reduce occurrence of algal blooms.

- Strategies to improve fish settlement around the reclaimed area will be supported, e.g., creation of fish shelters beyond the reclaimed area.

- The Honourable Mayor stated during the Public Hearing that one of the projects being envisioned when the reclamation is implemented is provision for fisherman's wharf.

2.3 The Air

- By nature of the project and by virtue of its location at sea, the air module which relates to the quality of the ambient air **at land-*where communities and potential air pollution receptors are located***- is not deemed significant. In addition the reclamation activities do not involve use of air pollution generating equipment on regular basis. In case of usage, this will be for power generating equipment and for pumps which will be on temporal basis only. This equipment will be located on the barges at sea.

- Consideration of noise which will be generated by the dredging activities will be reckoned from the distance of the noise generators to the various establishments on shore.

- During the operations phase-i.e. after completion of the reclamation works- ambient air quality becomes relatively more important in view of the discharges from motor vehicles which are expected to increase in number.

- As stated in **Section 2,** the EIA herein submitted for which an ECC is being applied for covers only the reclamation activities.

- For an appreciation of the potential impacts on the air environment and climate change phenomenon, the activities during the reclamation works are shown in **Table 2.3.1** through which the impacts may be gleaned.

Table 2.3.1 Matrix of Reclamation Activities in Relation to Impacts

Major Activities	Sub Activities with Potential Impacts on Air and Climate Change	Remarks
○ Reclamation ○ Loss of small portion of Manila Bay water (0.082% of surface area)	○ See below	○ Effect on temperature rise of small water body loss deemed minimal
○ Dredging ○ (To remove undesirable sea bed materials)	○ Operation of dredging equipment, use of electric power, e.g. by generating sets	○ Short term only. ○ Fuel used in generating sets and heavy equipment will generate CO2 and criteria pollutants.
Reclamation Proper		
○ Sea travel of dredging vessel from site to San Nicholas Shoal	○ Use of fuel (diesel oil) to propel vessel and dredgers/cutters will generate combustion products	○ Pollution source is mobile in nature and is short term, i.e. only during the transport of vessel and operation of dredging equipment
○ Filling (Materials to be imported)	○ Same as above	○ Same as above
○ Installation of sub structures, e.g. containment sheets or curtains	○ Same as above	○ Same as above
○ Leveling of reclaimed area to	○ Use of compaction and other equipment, potential	○ Same as above

Major Activities	Sub Activities with Potential Impacts on Air and Climate Change	Remarks
desired grades	use of generating sets, ○ Temporary concrete mix batching plan.	○ Same as above with potential fugitive dust generation.
○ Construction of support facilities, roadways, drainage system, etc.	○ Use of miscellaneous construction equipment, potential use of generating sets ○ Temporary concrete mix batching ○ Plant may be opted.	○ Same as above
○ Soil Stabilization	○ Minimum use of equipment	○ Essentially no air pollution discharges

It is seen from the **Table 2.3.1** that the potential sources of air pollution as well as of greenhouse gas (i.e. CO_2) are the various construction equipment used during construction or reclamation activities.

Air Pollution Impacts During Operation of the Dredging Equipment and Transportation of Sea Vessels

The most important aspect of the vessel operations in respect to potential air pollution is that the dredging vessel(s) operate at sea. The aspect of the operations that generate air discharges is during the travel to/from site to the San Nicholas Shoal. Thus, the air impact area and the receptors of air pollutants is the area within the navigational lane shown in **Figure 2.3.1** such impact area not being populated.



Figure 2.3.1 The Air Resource Impact Area from the Vessel Operation

The total fuel consumption for the entire reclamation phase is estimated as follows:

- Fuel consumption ≈ 2 gal (38,400/40) x 1.5 + 2 (16 000/40) x 3 =2,880 + 2,400 = 5,280 / 46 000 m3 fill or 11 478 260 gal or **4.34499 e7 liters.**

  For 2 round voyages per day estimated fuel consumed = 4.34499 e7 (92,000 hopper fill) ÷ (100 000 000) = 40,019 liters.

This amount of diesel fuel is equivalent to 20 SUVs traversing the roads of Metro Manila in 1 day.

From the discussions it may be concluded that the operation of the vessels will not cause significant air quality deterioration.

In addition, the details on the specific construction methodology, schedule of equipment to be used and in particular the source of electric power for the construction works will be determined after the award of contract to the reclamation work company/entity. This process will necessarily be undertaken after securing of the ECC so that the conditions stipulated in the ECC shall be duly incorporated.

The fact that an ECC is a planning tool is again reflected in the above statement, i.e. that the ECC and its conditions and the EIA document that would be accepted by the EMB which shall serve as the basis for decision-making on the ECC application will provide the important inputs for integration in the various phases of the project.

2.3.1 Meteorology

2.3.1.1 Change in the local climate e.g. local temperature

It may be gleaned from **Table 2.3.2** that there are no activities that will impact on the local climate particularly temperature. It is significant to note that the construction works will be undertaken for a short period of not more than two (2) years (preliminary estimate only, including soil stabilization of approximately one year). Thus, this short duration is not expected to impact on local climate. The loss of 600,000 sq.m. out of 1,800 sq.km. of the Manila Bay water (reckoned in terms of surface area) is considered insignificant to cause change in local temperature.

2.3.1.2 Monthly average rainfall and temperature of the area; Climatological normals/extremes; Wind rose diagrams; Frequency of Tropical cyclones

The climatological normal and extremes are provided in **page 2.3-5.** The climatological normals in the project site are shown in **Table 2.3.2** below.

Table 2.3.2 Climatological Normals

Month	Rainfall (mm)	Rainy Days	Wind Speed	Wind Direction
Jan	13.5	4	3	NE
Feb	7.3	2	3	SE
Mar	21.4	3	4	SE
Apr	18.7	3	4	SE
May	138.6	10	4	SE
Jun	283.8	10	4	SW

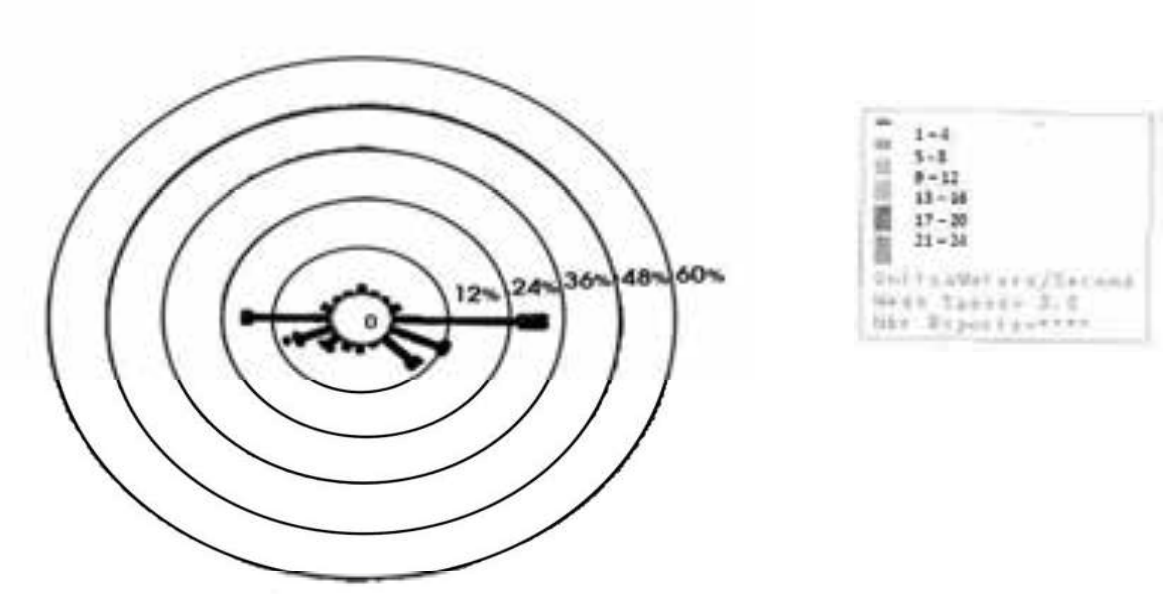
Jul	364.1	22	4	SW	
Aug	476.3	22	5	SW	
Sep	334.1	20	4	SW	
Oct	200.5	18	3	NE	
Nov	111.4	4	3	NE	
Dec	56.9	9	3	NE	
Annual	**2025.7**	**143**	**4**		**NE/SW/SE**

The main factor affecting the temporal distribution of rainfall in the area is the monsoon circulation. From June to October, the warm moist southwest monsoon air mass (*Habagat*) coming from the Indian Ocean and the southern hemisphere passes over the area from the southwest direction brining most of the rainfall of the year. During the northeast monsoon season from December to February, the air masses passing over the area is cold and dry with most of its moisture content released over the eastern coast of Luzon.

In addition to the monsoons, the other rainfall-causing phenomena in the area were cited as being the tropical cyclones, the Easterly Waves and the Intertropical Convergence Zone (ITC). The tropical cyclones, most frequent in the months of June to September, bring very intense rainfall over the area. The disturbances in the Easterlies cause some rainfall during the transition between the monsoon periods. The ITCZ contributes to the rainfall during June to July. Also, as in any tropical country, thermal convection due to isolated heating of ground surface contribute significantly to the annual rainfall as scattered rain showers and thunderstorms.

As seen in **Table 2.3.2**, the mean annual rainfall is 2025.7 mm. The wettest period occurs during the months of June to September with mean monthly values ranging from 283.8 mm to 476.3 mm. The driest period occurs from January to March with mean monthly rainfall values of 7.3 to 21.4 mm. The mean annual number of rainy days is 143, with the months of July to September having the greatest frequency of rains with 20 to 22 rainy days in a month.

The monthly wind rose diagrams are provided in **Annex 6** while the annual is shown below.



FREQUENCY TABLE
NAIA (MIA), Pasay City
Wind Speed and Direction
Annual (1971-1999)

Direction / Speed inputs	N	NNE	NE	ENE	E	ESE	SE	SSE
CALM								
1 – 4	1.8	1.2	1.0	2.4	25.6	11.0	7.9	0.9
5 – 8	0.1	0.0	0.1	0.1	6.2	2.1	1.6	0.0
9 – 12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	**1.9**	**1.2**	**1.1**	**2.5**	**2.2**	**13.1**	**9.5**	**0.9**

Direction / Speed inputs	N	NNE	NE	ENE	E	ESE	SE	SSE	TOTAL
CALM									
1 – 4	2.2	1.6	2.6	6.9	15.9	2.4	0.9	0.9	85.4
5 – 8	0.1	0.2	0.6	1.2	1.6	0.1	0.1	0.1	14.2
9 – 12	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.2
>12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	**2.3**	**1.8**	**3.3**	**8.1**	**17.6**	**2.5**	**1.0**	**1.0**	**100**

Figure 2.3.2 The Windrose Diagrams for the Project Site and Environs

2.3.1.3 Consideration of the Climate Change Projections (2020 and 2050) for the Project Site/Region

The projected seasonal temperature increase, seasonal rainfall change and frequency of extreme events in 2020 and 2050 under the medium-range emission scenario in the provinces in NCR are presented in Tables below



To use the tables and arrive at values of seasonal mean temperature and seasonal rainfall in 2020 and 2050 in any of the provinces, the projections are added to the observed values (presented in each of the tables).

For example, in Metro Manila, the projected values in 2020 are:

a. DJF mean temperature = (26.1^0c + 1.0^0c) =27.1^0c
b. DJF rainfall= (107.5mm+107.5(-12.8%)mm) = (107.5-13.8)mm or 93.7 mm;
c. Number of days with Tmax > 35^0c in Quezon City during the 2006-2035 period (centered at 2000) = 1,984;
d. Number of days in Quezon City during the 2006-2035 period (centered at 2020)= 6,302; and
e. Number of days with rainfall? 300mm in Quezon City during the 2006-2035 period (centered at 2020) =8.

Table 2.3.3 Seasonal temperature increase (in ^{0}c) in 2020 and 2050 under medium-range emission in provinces in NCR

	Observed baseline (1971-2000)				CHANGE in 2020 (2006-2035)				CHANGE in 2020 (2006-2035			
	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON
NCR												
Metro Manila	26.1	28.8	28.0	27.4	1.0	1.1	0.9	1.0	2.0	2.1	1.8	1.9

Table 2.3.4 Seasonal rainfall change (in%) in 2020 and 2050 under medium-range emission in provinces in NCR

	Observed baseline (1971-2000)				CHANGE in 2020 (2006-2035)				CHANGE in 2020 (2006-2035			
	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON
NCR												
Metro Manila	107.5	198.5	1170.2	758.7	-12.8	-33.3	8.5	0.0	-17.3	-38.5	21.3	3.7

Table 2.3.5 Frequency of extreme events in 2020 and 2050 under medium-range emission scenario in provinces in NCR

Provinces	Stations	No. of Days w/Tmax>35^0c			No. of Dry Days			No. of Days w/Rainfall >200mm		
		OBS (1971-2000)	2020	2050	OBS	2020	2050	OBS	2020	2050
Metro Manila	Port Area	299	1176	2118	7380	6445	6382	12	12	13
	Science Garden	1095	1984	3126	7476	6302	6220	9	13	17

Note:

- For Kalookan North, Quezon City, Marikina, Pasig, Taguig, San Juan Mandaluyong, use values of Science Garden

- For Navotas, Kalookan South, Malabon and Valenzuela, use values of Port Area
- OBS- Observed Baseline

From the above projections may be observed the following:

- Maximum seasonal temperature increase of 2.1 deg C may be expected in the long term (2036-2065).
- There is predicted significant number of days of temperatures exceeding 35 deg C.
- The decreases in rainfalls are greater than the increases.

The above projections will be experienced during the operations phase of the project for which initial assessments are herein made:

- Rainfalls will impact on storm water flows from the reclaimed area. The drainage system will be engineered accordingly. More importantly the channels of the reclaimed land will be reviewed in detail to ensure the storm water discharges are not constricted.

Among the potential impacts of temperature increases are:

- Greater energy (electricity) use for air conditioning units with potential concomitant greater generation of **CO2,** depending on the energy mix in the future. (i.e. use of fossil fuels versus renewable energy)

- **Potentially greater energy use in vehicles which are designed on the basis of ambient conditions. This could mean higher CO2 generation unless more efficient fuels are to be used in the long term future.**

  However, in event of such above-described scenarios same impacts of ghg inventories could be experienced without the project as the activities during the operations phase will take place in other sites and the generated ghg will be released to the atmosphere.

2.3.1.4 Frequency of Tropical Cyclones

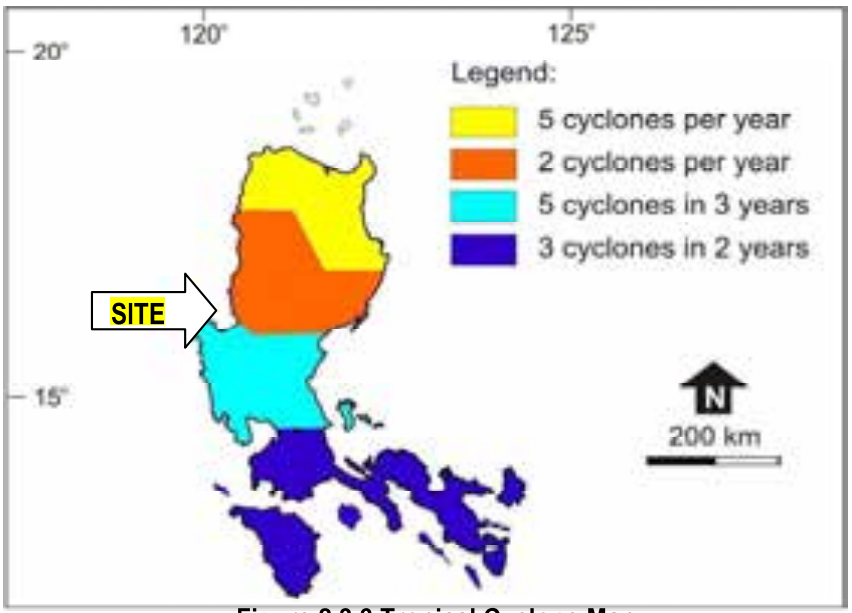


Figure 2.3.3 Tropical Cyclone Map

2.3.2 Air Quality

2.3.2.1 Degradation of air quality.

Use DENR standard methods and procedures for sampling and analysis. if applicable, provide air dispersion modeling (include worst case scenario of failure of APCD);

The DENR/EMB has been reporting annually the air quality for Metro Manila. However, there are some comments on the actual significance of these results.

For indicative purposes, the ambient air quality based on an air dispersion modeling is hereunder presented, **Figure 2.3.2** page **2.2-5**. This modeling is considered more reflective of ambient air quality than spot monitoring and testing because (a) data is used on annual geometric mean and thus over a longer period of time and (b) it factors in meteorological conditions and contributions of various sources.

Further, the parameter used in this model is PM10 considered as a more representative air quality/health parameter than TSP. The air quality near the project site as predicted in the modeling reveals that the ambient air quality guidelines are met. The problem areas are on the roadsides such as EDSA. Actual air monitoring sampling and tests were conducted in the impact areas of the project site.

The details including the methodology which complies with the DENR protocol are provided in **Annex 1.**

The summarized results shown in **Table 2.36** indicate the following:

- The values of the concentrations of the criteria pollutants are well within the NAAQVs prescribed under the Philippine Clean Air Act.
- The values for PM10 are relatively high in comparison with the other pollutants; this is not surprising in the light of the contribution of area sources to Particulate Matters.
- Carbon Monoxide was included among the parameters in recognition of incomplete combustion of fuels in vehicles traversing the vicinity of the project site.
- The values for PM10 are relatively high in comparison with the other pollutants; this is not surprising in the light of the contribution of area sources to Particulate Matters.
- Carbon Monoxide was included among the parameters in recognition of incomplete combustion of fuels in vehicles traversing the vicinity of the project site.

Table 2.3.6 Results of Ambient Air Quality Monitoring (Adjacent to Project Site)

Stn. No.	LOCATION	PM10 µg / Nm^3	SO_2 µg / Nm^3	NO_2 µg / Nm^3	CO mg / Nm^3
1	Near Yacht Club	68	3.4	3.4	0.1
2	Near PICC Area	42	2.4	4.8	0.1
3	Near Sofitel Basketball Court	38	9.9	7.2	0.7
4	Near Coastal Mall Area	52	10.0	36.6	0.3
5	Near D. Macapagal Road	44	10.2	47.3	0.2
DENR NAAQSSAP		**200**	**340**	**260**	**--**
DENR NAAQGV		**--**	**--**	**--**	**35**
Sampling Dates: January 28-29, 2013					

*Provided in **Annex 5** is the Ambient Test Results*

Table 2.3.7 Results of Ambient Air Quality Monitoring (Adjacent to Project Site)

Stn. No.	Time of Sampling	MIN (dBA)	MAX (dBA)	MEAN (dBA)	MEDIAN (dBA)	DENR (dBA)*
1	1435H-1440H	63.8	76.7	69.1	69.0	**65**
2	1540H-1545H	53.1	66.7	57.0	56.4	**65**
3	1130H-1135H	51.6	60.8	54.5	54.2	**65**
Sampling Date: January 28-29, 2013						
Stn. No.	**Time of Sampling**	**MIN (dBA)**	**MAX (dBA)**	**MEAN (dBA)**	**MEDIAN (dBA)**	**DENR (dBA)***
1	1505H-1510H	58.4	68.7	64.1	64.2	**65**
2	1720H-1725H	60.3	80.5	70.1	70.2	**65**
Sampling Date: January 28-29, 2013						

*Provided in **Annex 5** Test Results*

Table 2.3.8 Results of Ambient Air Quality Monitoring (Adjacent to Project Site)

Stn. No.		MIN (dBA)	MAX (dBA)	MEAN (dBA)	MEDIAN (dBA)	DENR (dBA)*
1	Northeast part of the proposed Pasay Reclamation and Extension Project, in front of Coconut Palace, Malate, Manila.	53.3	80.9	69.9	69.8	**65**
2	In front of SM – Mall of Asia (MOA), Pasay City, Metro Manila. Salinity	67.0	81.5	75.3	75.6	**65**
3	Near the mouth of Parañaque River, Parañaque City, Metro Manila	69.1	83.7	74.5	74.3	**65**
Sampling Date: August 2014						

Degradation of Air Quality

The degradation of the ambient air as a result of the reclamation activities is considered insignificant for the following reasons:

- There are no major generators of air pollution.
- There are no significant movements of construction vehicles on land.
- The activities are confined to the Manila Bay water; potential air pollution discharges can result from the use of fossil fuels by equipment, machinery and in the movement of barges.
- The construction works are located away from the population centers. Any air pollution will not reach the population noting further that there is a buffer zone between the reclamation site and the area east of the site which is the direction of prevailing wind, referring to the Wind Rose Diagram.

If applicable, include discussions of odor due to operation

During the operations phase, the generation of foul odor from the various locators is deemed absent or manageable because:

a. In the deed of restrictions for potential locators, activities. Establishments and operations that could generate foul odor will not be allowed. This is not only for environmental considerations but likewise to maintain the quality of the project.

b. The potential may exist that garbage which could generate foul odor may be entrapped in sections or corners of the reclaimed land. These could readily be managed by the provision for islands which would allow Bay water circulation and by the installation of mitigation measures to prevent such garbage entrapment.

In addition, during the reclamation/construction phase which is the coverage of the ECC being applied for at this time, there are no odor generating activities involved.

On the other hand, Manila Bay water circulation will not be significantly affected which may result in odor generation if garbage is trapped in the reclamation area.

Degradation of Air Quality

The degradation of the ambient air as a result of the reclamation activities is considered insignificant for the following reasons:

- There are no major generators of air pollution.
- There are no significant movements of construction vehicles on land.
- The activities are confined to the Manila Bay water; potential air pollution discharges can result from the use of fossil fuels by equipment, machinery and in the movement of barges.
- The construction works are located away from the population centers. Any air pollution will not reach the population noting further that there is a buffer zone between the reclamation site and the area east of the site which is the direction of prevailing wind, referring to the Wind Rose Diagram.

2.3.2.2 Increase in ambient noise level

Table 2.3.9 Noise Level Standards of the DENR

Category of the Area	Daytime (dBA)	Morning & Evening (dBA)	Nighttime (dBA)
AA	50	45	40
A	55	50	45
B the Project Site	65	60	55
C	70	65	60
D	75	70	65

Notes: *Class AA – Areas within 100m rom school sites, hospitals*
Class A – Residential Area
Class B – Commercial Area
Class C – Light Industrial Area
Class D – Heavy Industrial Area

Station 1 **Near Yacht Club**
Latitude: N 14◦33'78.2"
Longitude: E 120◦59'11.6"

Station 2 **Near PICC Area**
Latitude: N 14◦33'35.0"
Longitude: E 120◦58'86.7"

Station 3 **Near Sofitel Basketball Court**
Latitude: N 14◦33'08.3"
Longitude: E 120◦58'93.3"

Station 4 **Near Coastal Mall Area**
Latitude: N 14◦31'10.8"
Longitude: E 120◦59'46.7"

Station 5 **Near D. Macapagal Road**
Latitude: N 14◦31'29.9"
Longitude: E 120◦59'40.5"

The sampling station map is provided in Figure 2.3.4.



Figure 2.3.4 Noise Sampling Station Map (January 28-29, 2013)



Figure 2.3.5 Noise Sampling Station Map (August 2014)

Degradation of the Noise Levels

- Noise will not be a significant nuisance because the population center is distant from the activity areas.

- Noise suppressors will be installed for heavy machineries and equipment.

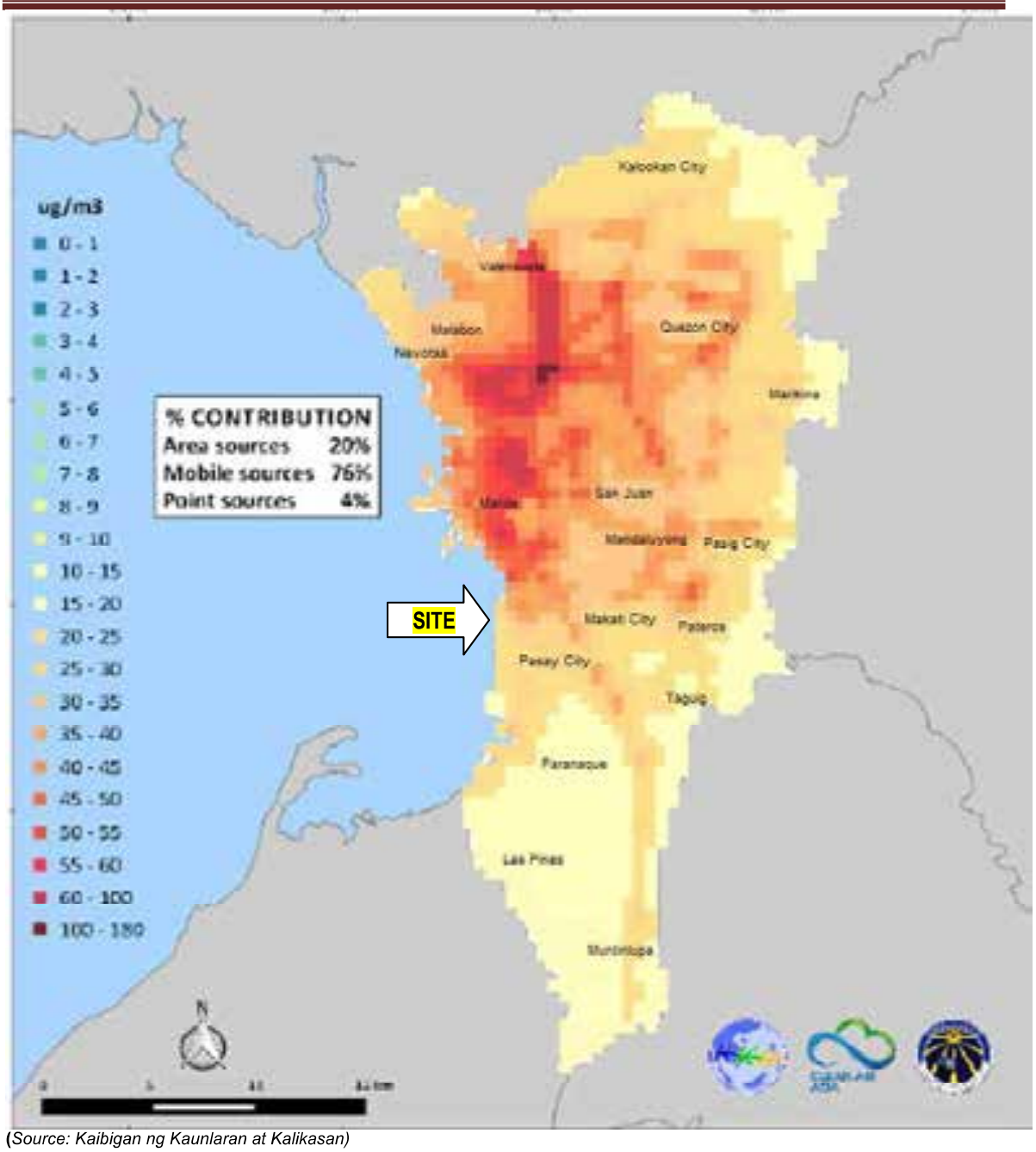
The noise levels measured in both the sea water and on shore are well within the DENR standards. The sampling stations are selected such that they represent the major potential receptors of noise and are therefore located along the roadways which include not only stations fronting the project but even farther out.

The reclamation project will not cause nuisance (noise) to the population centers or business establishments because the activities are confined to a portion of the Manila Bay away from these centers. Further noise levels from dredging operations are reported to be within 70 dbA *(Ref: Environmental Statement for Southampton Approach Channel Dredge) while the range of noise levels from pile driving is 82-105. (Construction Noise: Workers' Compensation Board of Vancouver, BC)* **Further there will be no or limited night time activities.**

Noting that the highest noise levels may be generated by pile driving these noise levels are not considered to be a major concern because:

- *Pile driving is neither a continuous operation and is short-term only. Pile driving would be required in the construction of containment sheets intended to curtail dispersion of dredged silts.*

- *Pile driving activities are conducted in projects on shore and even in populated and commercial districts such as during the construction of malls and commercial complexes.*



(*Source: Kaibigan ng Kaunlaran at Kalikasan)*

Figure 2.3.6 PM Modeling for Manila

From the above map it may be seen that the project site and immediate vicinities are within the $PM_{2.5}$ guideline values.

2.3.3 Contribution in terms of greenhouse gas emissions.

Data on Greenhouse gasses (i.e. carbon dioxide, nitrous oxide); Calculation of projected GHG emission. Discuss the project's contribution in terms of greenhouse gas emissions (Applicable only for projects with significant GHG emissions)

Climate change phenomenon as induced by ghg emissions needs to be reckoned from the global context. Thus in assessing the local/site specific contribution in terms of greenhouse gases the Philippine inventory should serve as the starting point/basis for an evaluation of a project. The Philippine ghg inventory based on the 2nd NFCC and on global inventory records are shown below.

Table 2.3.10 Philippine ghg emissions in Gg (2000)

Sector	CO_2, Gg	CH_4,Gg	N_2O, Gg	*CO_2eEmission,Gg
Energy	**62,499.10**	**304.14**	**2.52**	**69,667.24**
Industrial Processes	**8,604.74**	**0.24**	**-**	**8,609.78**
Agriculture	**-**	**1,209.79**	**37.41**	**37,002.69**
LUFC	**(104,040.29)**	**(46.28)**	**(0.32)**	**(105,111.37)**
Waste	**-**	**500.67**	**3.50**	**11,599.07**
Totals	**(32,936.45)**	**1,968.56**	**43.11**	**21,767.41**

CH4 GW Potential – 21; N_2O GW Potential-310; * - CO_2 + (CH4*21) + (N_2O*310) *Source: Philippine NFS on Climate Change 2010-2012*

Table 2.3.11 List of Top ghg emitting countries by 2007 emissions

Source: "Carbon Dioxide Information Analysis Center (US DOE)"

Rank	Country	Annual CO_2 emissions (in thousands of metric tons)	Percentage of global total
	World	29,321,302	100%
1	China	6,538,367.00	22.30%
2	United States	5,838,381.00	19.91%
3	India	1,612,362.00	5.50%
4	Russia	1,537,357.00	5.24%
5	Japan	1,254,543.00	4.28%
6	Germany	787,936.00	2.69%
7	Canada	557,340.00	1.90%
8	United Kingdom	539,617.00	1.84%
9	South Korea	503,321.00	1.72%
10	Iran	495,987.00	1.69%
11	Mexico	471,459.00	1.61%
12	Italy	456,428.00	1.56%
13	South Africa	433,527.00	1.48%
14	Saudi Arabia	402,450.00	1.37%
15	Indonesia	397,143.00	1.35%
TOTAL TOP 15 COUNTRY EMITTERS		**21,371,218**	73 %
44	Philippines	**70,916.00**	0.24%

The Philippines' contribution as percentage of the world inventory is 0.24 % while as percentage of the top 15 country emitters the contribution is

(70,916.00 / 21,371,218,000) x 100 = **0.33 %**

Carbon Dioxide Emission

The sources of carbon dioxide emission from the project as may be gleaned below are the fuels used in the operation of heavy machinery and equipment such as dredgers, pile drivers and the barges. These are considered minor in terms of the global inventory, in addition to the short term use of these units. Although there are no calculations at this time estimating the amount of fuels and thus of CO2 that would be generated by the various reclamation/construction equipment, this statement is made from the macroscopic perspective of total net country CO2 emission which per the NFCC report is negative (-32,936.45 gg), i.e. net of LUCF.

Basis for estimation of CO2

Hopper Capacity = 46,000 m3
Propulsion Power = 38,400 Hp
Pumping Power = 16,000 Hp
Speed = 18 kn = 33.34 km/hour
Distance to San Nicolas Shoal =25 KM

Time Cycle per 46,000 m3 fill = (25/33,34) x 2 + 3 hours = 1,5 + 3 = 4 hours

Kw-hr consumed = (38,400 x 0.745) x 1.5 + (16,000 x 9.745) x 3 = 42912 +35760 = 78672 kw hr/46,000 m3 fill

For 100 000 000 cu.m. fill

Kwhr = (78762 / 46,000) x 100 000 000 = 171 221 739 kw hr

Fuel consumption ≈ 2 gal (38,400/40) x 1.5 + 2 (16 000/40) x 3 =2,880 + 2,400 = 5,280 / 46 000 m3 fill or
11 478 260 gal

Unit Carbon dioxide generation =2,778 g x 3.66 x 0.99 = 10,084 g/gal diesel oil

Grams CO2 generated 114 782 600 grams or 57 391 385 grams per year = 57 thousand tons/year

Inventory of top 15 country emitter = 21,371,218 thousand tons per year
Contribution of project = minimal

During the period that the reclaimed land is allowed to settle to gain integrity there will be hardly any carbon dioxide emissions because there will be no significant activities at the reclamation area.

It is thus concluded that the project is not associated with significant GHG generation.

The two aspects of Climate Change issues are Mitigation and Adaptation.

On mitigation, it is proper to view the GHGs NOT from the perspective of this particular project but from the country perspective of total GHG inventory. In turn the country's GHG inventory is to be viewed from the global.

The EIA Team Leader for this Project has led the industry/business sectors through the Federation of Philippine Industries in consultations with the Climate Change Commission in

determining the appropriate GHG inventory and mitigation options for the Philippines. The consultations are ongoing and will consider President Aquino's speech in Paris, provided in **Annex 16.**

The mitigation options so far adopted by the Philippines are the following:

Based on President Aquino's speech

- Massive Reforestation
- Renewable Energy Power Plant

On the other hand the mitigation options of the Climate Change Commission are as follows:

Scenario	Category	Cumulative Mitigation Potential (Million tons CO2e)	Cumulative Discounted Abatement Cost (2010 USD/tCO2e)
Motor Vehicle Inspection System	Transport	11.40	-202.00
Jeepney Modernization	Transport	22.36	-184.00
Congestion Charging	Transport	4.18	-187.00
Driver Training	Transport	9.31	-153.00
Biofuels	Transport	84.03	86.00
Enhanced Bus Services Including BRT	Transport	6.78	358.00
Rail (Mass Transit)	Transport	2.69	3,115.00
Municipal Solid Waste Digestion	Waste	7.57	-8.00
Methane Recovery from Sanitary Landfills	Waste	9.26	-3.00
Methane Flaring	Waste	10.75	15.00
Composting	Waste	10.56	100.00
Eco Efficient Cover	Waste	12.90	57.00

Mitigation Options from Energy

Scenario	Category	Cumulative Mitigation Potential (Million tons CO2e)	Cumulative Discounted Abatement Cost (2010 USD/tCO2e)
Home Lighting Improvements	Energy	2.03	-113.00
Home Appliance Standards	Energy	10.07	-162.00
Efficient LED Lighting	Energy	4.82	-28.00
NREP Biomass	Energy	3.69	1.00
NREP Solar	Energy	5.44	12.00
Natural Gas for Coal	Energy	24.11	-28.00
NREP Wind	Energy	44.00	17.00
NREP Ocean	Energy	3.40	12.00
NREP Large Hydro	Energy	57.26	37.00
NREP Small Hydro	Energy	10.15	51.00
NREP Geothermal	Energy	77.75	79.00
Biodiesel Target	Energy	20.07	122.00

Scenario	Category	Cumulative Mitigation Potential (Million tons CO2e)	Cumulative Discounted Abatement Cost (2010 USD/tCO2e)
Forest Protection	Forestry	163.06	14.00
Forest Restoration & Reforestation	Forestry	218.96	7.00

Scenario	Category	Cumulative Mitigation Potential (Million tons CO2e)	Cumulative Discounted Abatement Cost (2010 USD/tCO2e)
Increase Glass Cullet Use	Industry	0.08	-992.00
Cement Clinker Reduction	Industry	31.18	-333.00
Cement Waste Heat Recovery	Industry	4.06	-65.00
Biomass in Cement	Industry	38.11	-30.00
Biomass Co-firing	Industry	28.25	-16.00

On Climate Change Adaptation

Climate change adaptation measures for the Philippines are contingent on commitments made and support from the international communities resulting from the December Paris Climate Change Summit.

The action plan for the Philippines has yet to be officially pronounced by the Office of the President. The scope of such in so far as Reclamation Projects are concerned are to be yet known. Notwithstanding the still-awaited policies on adaptation, following are the key Climate Change hazard scenarios and the measures to be adopted:

Accelerated Sea Level Rise
The reclaimed land platform will be elevated by 4 m above MLWL

Storm surges
The reclaimed land itself will provide sheltering effect during episodes of storm surges.

Wave deflectors will be installed in strategic places.

2.3 .4 If applicable, include discussions of odor due to operation

During the operations phase the generation of foul odor from the various locators is deemed absent or manageable because:

- In the deed of restrictions for potential locators, activities, establishments and operations that could generate foul odor will not be allowed. This is not only for environmental considerations but likewise to maintain the quality of the project.

- The potential may exist that garbage which could generate foul odor may be entrapped in sections or corners of the reclaimed land. These could readily be managed by the provision for islands which would allow Bay water circulation and by the installation of mitigation measures to prevent such garbage entrapment.

During the reclamation/construction phase which is the coverage of the ECC being applied for at this time, there are no odor generating activities involved.

In addition, Manila Bay water circulation will not be significantly affected which may result in odor generation if garbage is trapped in the reclamation area. A 200-meter buffer zone for water circulation will be provided.

2.4 THE PEOPLE

The **People** module is one of the vital components in the EIA system because it highlights the impacts of the proposed project on the affected communities. More importantly "People" factor could be a key to the success of a project.

Methodology and Limitations

Baseline data presented in this module are demographic data derived from 2011 Comprehensive Land Use Plan (CLUP) of the City of Pasay.

It may be noted that the referenced years for the data are different inasmuch as the available information are for different years.

Background

Based on the 2011 Comprehensive Land Use Plan (CLUP), Pasay City is approximately at $14^0$32' and longitude $121^0$00'. It is situated within the western coast of Metro Manila or the National Capital Region (NCR). Pasay City is bounded on its north by the City of Manila, on its northeast side is the City of Makati and the Municipalities of Taguig. Parañaque City are on the west and south of Pasay City, respectively while the Manila Bay is on its west.

Pasay City is the third smallest political subdivision among the cities and municipalities of NCR. It is composed of seven (7) districts, subdivided into twenty (20) zones having a total of 201 barangays.

The proposed reclamation project will be situated in Barangay 76, Pasay City.

Provided in **Figure 2.4.1** and **Figure 2.4.2** are the location map and the Barangay Boundaries of Pasay City.



Figure 2.4.1 Location Map of Pasay City
SOURCE: *2011 Comprehensive Land Use Plan (CLUP) of Pasay*

Demographic Profile

Land Area

Pasay City has a total area of 1,805.11 hectares of which the city proper or Barangays 1 to 201 occupies of about 1, 399.50 hectares or 77.53 percent of the total area. The Cultural Center of the Philippines Complex (CCP) occupies around 191.95 hectares or (10.63%). The rest of the reclaimed area occupies 213.66 hectares (11.84%) The area distribution of the city per Barangay is shown in **Table 2.4.1**.

Table 2.4.1 Area Distribution (in Hectares)

Brgy.	Area	Percent to Total (%)	Brgy.	Area	Percent to Total (%)	Brgy.	Area	Percent to Total (%)	Brgy.	Area	Percent to Total (%)
1	1.48	0.08	51	2.26	0.13	101	1.09	0.06	151	2.94	0.16
2	4.37	0.24	52	2.37	0.13	102	1.11	0.06	152	4.10	0.23
3	1.84	0.10	53	1.01	0.06	103	1.42	0.08	153	1.64	0.09
4	2.89	0.16	54	1.94	0.11	104	2.51	0.14	154	0.94	0.05
5	1.53	0.08	55	2.25	0.12	105	0.91	0.05	155	1.52	0.08
6	1.47	0.08	56	1.01	0.06	106	1.13	0.06	156	2.23	0.12
7	2.58	0.14	57	0.91	0.05	107	2.24	0.12	157	1.93	0.11
8	1.94	0.11	58	4.31	0.24	108	2.82	0.16	158	1.93	0.11
9	1.43	0.08	59	3.79	0.21	109	0.90	0.05	159	2.95	0.16
10	2.99	0.17	60	3.55	0.20	110	1.78	0.10	160	1.69	0.09
11	1.82	0.10	61	0.40	0.02	111	1.50	0.08	161	5.46	0.30
12	1.89	0.10	62	0.49	0.03	112	1.41	0.08	162	3.10	0.17
13	13.95	0.77	63	2.18	0.12	113	2.84	0.16	163	2.23	0.12
14	2.48	0.14	64	1.15	0.06	114	2.38	0.13	164	1.37	0.08
15	3.61	0.20	65	4.45	0.25	115	2.12	0.12	165	7.13	0.40
16	1.30	0.07	66	2.81	0.16	116	2.35	0.13	166	2.12	0.12
17	1.69	0.09	67	1.83	0.10	117	1.38	0.08	167	1.38	0.08
18	4.61	0.26	68	1.56	0.09	118	2.26	0.12	168	2.16	0.12
19	1.10	0.06	69	1.24	0.07	119	2.64	0.15	169	3.07	0.17
20	2.25	0.12	70	6.12	0.34	120	2.88	0.16	170	1.46	0.08
21	1.78	0.10	71	1.02	0.06	121	2.02	0.11	171	3.05	0.17
22	0.56	0.03	72	1.47	0.08	122	0.99	0.05	172	3.65	0.20
23	4.14	0.23	73	6.06	0.34	123	0.91	0.05	173	1.41	0.08
24	2.44	0.14	74	3.30	0.18	124	2.64	0.15	174	2.44	0.14
25	2.16	0.12	75	9.34	0.52	125	2.37	0.13	175	1.52	0.08
26	1.86	0.10	76	50.45	2.79	126	1.22	0.07	176	2.25	0.12
27	1.90	0.11	77	4.22	0.23	127	2.90	0.16	177	4.48	0.25
28	3.82	0.21	78	3.33	0.18	128	2.26	0.13	178	3.58	0.20
29	1.88	0.10	79	4.20	0.23	129	1.21	0.07	179	7.05	0.39
30	1.18	0.07	80	2.64	0.15	130	2.82	0.16	180	46.20	2.56
31	2.80	0.16	81	1.62	0.09	131	2.28	0.13	181	2.34	0.13
32	2.97	0.16	82	0.71	0.04	132	2.73	0.15	182	9.69	0.54
33	5.88	0.33	83	2.11	0.12	133	2.82	0.16	183	543.89	30.13
34	2.93	0.16	84	1.31	0.07	134	1.23	0.07	184	8.63	0.48
35	3.56	0.20	85	3.88	0.22	135	4.04	0.22	185	18.31	1.01
36	4.43	0.25	86	1.56	0.09	136	3.05	0.17	186	2.88	0.16
37	4.56	0.25	87	1.22	0.07	137	2.52	0.14	187	16.62	0.92
38	8.40	0.47	88	3.19	0.18	138	1.29	0.07	188	8.79	0.49
39	5.53	0.31	89	1.24	0.07	139	1.33	0.07	189	2.67	0.15
40	5.53	0.31	90	2.00	0.11	140	1.10	0.06	190	60.81	3.37
41	4.20	0.23	91	1.73	0.10	141	1.69	0.09	191	45.60	2.53

Proposed 360 Hectares Reclamation Project
Local Government of Pasay City
Along Coast of Manila Bay, City of Pasay

Brgy.	Area	Percent to Total (%)	Brgy.	Area	Percent to Total (%)	Brgy.	Area	Percent to Total (%)	Brgy.	Area	Percent to Total (%)
42	2.66	0.15	**92**	2.28	0.13	**142**	1.11	0.06	**192**	18.81	1.04
43	1.69	0.09	**93**	2.79	0.15	**143**	5.88	0.33	**193**	13.99	0.78
44	5.94	0.33	**94**	2.91	0.16	**144**	7.02	0.39	**194**	4.87	0.27
45	2.73	0.15	**95**	2.51	0.14	**145**	6.65	0.37	**195**	3.85	0.21
46	3.90	0.22	**96**	2.26	0.13	**146**	3.33	0.18	**196**	2.83	0.16
47	4.10	0.23	**97**	6.0	0.33	**147**	2.40	0.13	**197**	10.7	0.60
48	1.80	0.10	**98**	4.39	0.24	**148**	9.83	0.54	**198**	18.09	1.00
49	4.02	0.22	**99**	1.88	0.10	**149**	1.19	0.07	**199**	5.25	0.29
50	0.95	0.05	**100**	3.38	0.19	**150**	1.89	0.10	**200**	4.81	0.27
									201	33.75	1.87
Area of Barangays 1 to 201								**1,399.50**			**77.53**
Reclamation (Existing)								**213.66**			**11.84**
Cultural Center of the Philippines Complex								**191.95**			**10.63**
TOTAL AREA								**1,805.11**			**100.00**



SOURCE: *2011 Comprehensive Land Use Plan (CLUP) of Pasay*

Figure 2.4.2 Barangay Boundaries of Pasay City

Population Size

According to the National Statistical Coordination Board (NSCB), Pasay has a **total population of about 392, 869** as of May 2010. The largest zone in Pasay is Zone 19. It has an area of about 5.10 square kilometers (1.997 sq mi). The smallest zone is Zone 1 which has an area of about ten (10) hectares (25 acres) that covers Barangay 1 to 3 and 14 to 17. Provided in **Table 2.4.2** is the 2010 Population data of Pasay.

Table 2.4.2 Population Data of Pasay

Name	Population (as of May 1, 2010)	Name	Population (as of May 1, 2010)
Barangay 1	1,035	Barangay 2	1,230
Barangay 3	964	Barangay 4	1,930
Barangay 5	1,016	Barangay 6	532
Barangay 7	550	Barangay 8	922
Barangay 9	249	Barangay 10	1,176
Barangay 11	391	Barangay 12	627
Barangay 13	2,627	Barangay 14	6,419
Barangay 15	867	Barangay 16	962
Barangay 17	668	Barangay 18	832
Barangay 19	535	Barangay 20	1,015
Barangay 21	978	Barangay 22	684
Barangay 23	1,438	Barangay 24	875
Barangay 25	603	Barangay 26	697
Barangay 27	321	Barangay 28	898
Barangay 29	1,757	Barangay 30	1,184
Barangay 31	1,537	Barangay 32	2,578
Barangay 33	759	Barangay 34	2,232
Barangay 35	550	Barangay 36	331
Barangay 37	996	Barangay 38	2,002
Barangay 39	1,024	Barangay 40	1,716
Barangay 41	1,245	Barangay 42	1,423
Barangay 43	2,581	Barangay 44	1,218
Barangay 45	943	Barangay 46	5,748
Barangay 47	906	Barangay 48	600
Barangay 49	422	Barangay 50	432
Barangay 51	2,246	Barangay 52	1,886

Name	Population (as of May 1, 2010)	Name	Population (as of May 1, 2010)
Barangay 53	461	Barangay 54	1,553
Barangay 55	667	Barangay 56	630
Barangay 57	1,493	Barangay 58	1,452
Barangay 59	968	Barangay 60	1,342
Barangay 61	2,541	Barangay 62	1,300
Barangay 63	646	Barangay 64	1,255
Barangay 65	2,736	Barangay 66	2,513
Barangay 67	979	Barangay 68	630
Barangay 69	916	Barangay 70	1,153
Barangay 71	620	Barangay 72	917
Barangay 73	985	Barangay 74	563
Barangay 75	1,174	**Barangay 76**	**5,975**
Barangay 77	1,604	Barangay 78	345
Barangay 79	726	Barangay 80	1,017
Barangay 81	3,034	Barangay 82	461
Barangay 83	843	Barangay 84	603
Barangay 85	936	Barangay 86	1,153
Barangay 87	455	Barangay 88	1,147
Barangay 89	644	Barangay 90	1,707
Barangay 91	1,285	Barangay 92	537
Barangay 93	314	Barangay 94	1,758
Barangay 95	1,034	Barangay 96	871
Barangay 97	967	Barangay 98	1,042
Barangay 99	1,242	Barangay 100	1,327
Barangay 101	330	Barangay 102	737
Barangay 103	956	Barangay 104	1,224
Barangay 105	592	Barangay 106	1,122
Barangay 107	1,534	Barangay 108	1,841
Barangay 109	1,028	Barangay 110	2,199
Barangay 111	1,156	Barangay 112	437
Barangay 113	1,742	Barangay 114	885
Barangay 115	1,149	Barangay 116	1,260
Barangay 117	1,048	Barangay 118	1,056

Name	Population (as of May 1, 2010)	Name	Population (as of May 1, 2010)
Barangay 119	1,351	Barangay 120	531
Barangay 121	892	Barangay 122	1,171
Barangay 123	1,258	Barangay 124	1,481
Barangay 125	1,327	Barangay 126	1,456
Barangay 127	2,021	Barangay 128	906
Barangay 129	925	Barangay 130	3,410
Barangay 131	1,000	Barangay 132	4,107
Barangay 133	1,406	Barangay 134	1,972
Barangay 135	3,371	Barangay 136	1,285
Barangay 137	2,455	Barangay 138	1,025
Barangay 139	850	Barangay 140	658
Barangay 141	585	Barangay 142	356
Barangay 143	3,361	Barangay 144	3,000
Barangay 145	7,808	Barangay 146	334
Barangay 147	1,587	Barangay 148	3,638
Barangay 149	328	Barangay 150	614
Barangay 151	678	Barangay 152	1,632
Barangay 153	1,310	Barangay 154	385
Barangay 155	768	Barangay 156	3,627
Barangay 157	2,419	Barangay 158	771
Barangay 159	1,338	Barangay 160	1,028
Barangay 161	2,574	Barangay 162	1,802
Barangay 163	1,064	Barangay 164	1,503
Barangay 165	4,863	Barangay 166	1,649
Barangay 167	719	Barangay 168	411
Barangay 169	2,328	Barangay 170	1,901
Barangay 171	3,004	Barangay 172	5,064
Barangay 173	1,903	Barangay 174	1,524
Barangay 175	1,954	Barangay 176	1,643
Barangay 177	5,665	Barangay 178	5,827
Barangay 179	5,483	Barangay 180	2,984
Barangay 181	2,876	Barangay 182	3,014
Barangay 183	25,040	Barangay 184	12,434

Name	Population (as of May 1, 2010)	Name	Population (as of May 1, 2010)
Barangay 185	4,967	Barangay 186	5,786
Barangay 187	4,185	Barangay 188	1,460
Barangay 189	1,359	Barangay 190	5,368
Barangay 191	4,133	Barangay 192	4,232
Barangay 193	7,956	Barangay 194	5,291
Barangay 195	2,161	Barangay 196	1,379
Barangay 197	3,671	Barangay 198	1,489
Barangay 199	2,034	Barangay 200	585
Barangay 201	22,985		

SOURCE: *http://www.nscb.gov.ph/activestats/psgc/municipality.asp?muncode=137605000&regcode=13&provcode=76. Retrieved on March 18, 2013*

Barangay 76, Zone 10 where the project will be situated has a total population of about 5,975 persons.

Population Growth

Based from the 2011 CLUP of Pasay, the year 2000 population is about 363, 000 total population that represents a 2.34% reduction from its year 1995 total population. It was in the year 1903 census that Pasay's population growth had been greater than the rest of Metro Manila only in the years 1918 to 1948. With regards to the succeeding census years, Pasay City's population growth becomes slower than the rest of Metro Manila. Population growth was decelerating until the year 2000 that saw an actual reduction. One reason for the decelerating trend is the out migration. Metro Manila such as Makati City and Paranaque became more attractive as settlement areas than Pasay City.

Furthermore, the Average Household Size (AHHS) in 1995 was about 4.7 in the city and growth from 1995 was about negative 9%. Barangay 17 had the highest AHHS with 6.57 while Barangay 30 had the smallest with 3.3. In terms of growth, the highest were Barangays 15, 17, 11, 12 and 5 with more than a hundred percent growth from 1995.

Provided in **Table 2.4.3** is the Population of Pasay with Annual Growth Rates from year 1903-2000.

Table 2.4.3 Population of Pasay City 1903-2000, with Annual Growth Rates Compared with Metro Manila

Census Year	Population	Annual Growth Rate (%)	Metro Manila's Annual Growth Rate (%)
1903	8,201	-	-
1918	18,697	5.65%	2.28%
1939	55,161	5.29%	3.72%
1948	88,728	5.42%	5.20%
1960	132,673	3.41%	3.83%
1970	206,283	4.51%	4.88%

Census Year	Population	Annual Growth Rate (%)	Metro Manila's Annual Growth Rate (%)
1975	254,999	4.33%	4.61%
1980	287,770	2.45%	3.58%
1990	368,366	2.50%	2.98%
1995	408,610	2.10%	3.53%
2000	363,000	-2.34%	2.11%

Source: National Statistics Office

Table 2.4.4 Population census of Pasay

Population census of Pasay		
Year	**Pop.**	**±% p.a.**
1990	368,366	—
1995	408,610	2.07%
2000	354,908	-2.82%
2007	403,064	1.82%
2010	392,869	-0.85%

SOURCE: *http://en.wikipedia.org/wiki/Pasay retrieved on March 18, 2013*

Population Density

According to the 2011 CLUP of Pasay, the population density of Pasay in the year 2000 is 25, 533 making Pasay as one of the most congested localities in NCR. 183 of the 201 barangays of the city had the biggest population, having 29, 450 or about 8.3% of the total city population. In the said year (2000), Barangay 183 had the biggest population having a total population of about 29,450 or about 8.3% of the total city population. Barangay 183 is followed by Barangays 201, 184, 193, and 145 having more than 2% each in population share. The smallest barangays are Barangays 35, 36 and 78 with less than 240 population.

The 17 localities in the National Capital Region (NCR), Pasay City ranked 12th in population size, 11th in number of households, 13th in average household size (which is less than NCR's 4.62), 16th in annual growth and 4th in population density (more than the density of NCR).

With a total land area of 38.55 km2, the city has a high density of 47.21/$m^{2.}$

Household Population

Provided below is the table for total Population and Number of Households of Pasay City by Barangay. Highlighted in brown color are the ten (10) barangays having the most numbers of household population.

Table 2.4.5 Population and Number of Households of Pasay City by Barangay, 2000

Barangay	Total Population	Household Population	Number Of Household	Growth 1995-2000	% Share 2000	Average HH Size
PASAY CITY	**354,908**	**353,798**	**78,180**	**-13%**	**100.00%**	**4.53**
Barangay 1	759	759	177	18%	0.21%	4.29
Barangay 2	1,459	1,459	346	-17%	0.41%	4.22
Barangay 3	1,207	1,207	268	-3%	0.34%	4.50
Barangay 4	2,147	2,147	457	4%	0.60%	4.70
Barangay 5	1,604	1,603	365	117%	0.45%	4.39

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Barangay	Total Population	Household Population	Number Of Household	Growth 1995-2000	% Share 2000	Average HH Size
Barangay 6	365	365	85	-35%	0.10%	4.29
Barangay 7	931	931	212	23%	0.26%	4.39
Barangay 8	1,641	1,641	390	-19%	0.46%	4.21
Barangay 9	351	350	83	-27%	0.10%	4.22
Barangay 10	1,198	1,164	260	-22%	0.34%	4.48
Barangay 11	1,784	1,784	367	487%	0.50%	4.86
Barangay 12	2,409	2,409	551	342%	0.68%	4.37
Barangay 13	1,247	1,247	231	17%	0.35%	5.40
Barangay 14	4,250	4,241	881	-34%	1.20%	4.81
Barangay 15	891	891	225	596%	0.25%	3.96
Barangay 16	284	284	66	-55%	0.08%	4.30
Barangay 17	271	271	77	489%	0.08%	3.52
Barangay 18	1,287	1,287	250	-43%	0.36%	5.15
Barangay 19	493	493	103	-17%	0.14%	4.79
Barangay 20	405	405	97	-37%	0.11%	4.18
Barangay 21	609	609	141	-38%	0.17%	4.32
Barangay 22	599	599	152	-48%	0.17%	3.94
Barangay 23	1,627	1,627	388	-12%	0.46%	4.19
Barangay 24	664	664	167	-40%	0.19%	3.98
Barangay 25	375	370	93	-66%	0.11%	3.98
Barangay 26	665	665	166	-34%	0.19%	4.01
Barangay 27	387	387	77	-40%	0.11%	5.03
Barangay 28	959	959	219	-25%	0.27%	4.38
Barangay 29	1,710	1,710	407	-30%	0.48%	4.20
Barangay 30	862	862	182	-33%	0.24%	4.74
Barangay 31	1,089	1,089	226	-41%	0.31%	4.82
Barangay 32	1,324	1,324	248	-26%	0.37%	5.34
Barangay 33	711	711	169	-1%	0.20%	4.21
Barangay 34	1,033	1,033	222	-8%	0.29%	4.65
Barangay 35	236	227	63	-27%	0.07%	3.60
Barangay 36	235	235	42	-59%	0.07%	5.60
Barangay 37	671	671	159	-45%	0.19%	4.22
Barangay 38	1,479	1,479	385	-41%	0.42%	3.84
Barangay 39	1,411	1,407	297	-7%	0.40%	4.74
Barangay 40	1,809	1,783	378	-27%	0.51%	4.72
Barangay 41	863	861	171	-27%	0.24%	5.04
Barangay 42	1,326	1,326	339	-32%	0.37%	3.91
Barangay 43	2,029	2,029	482	-15%	0.57%	4.21
Barangay 44	1,262	1,260	289	-26%	0.36%	4.36
Barangay 45	1,148	1,148	223	-8%	0.32%	5.15
Barangay 46	4,509	4,509	868	-25%	1.27%	5.19
Barangay 47	984	967	197	-21%	0.28%	4.91
Barangay 48	525	523	103	-18%	0.15%	5.08

Barangay	Total Population	Household Population	Number Of Household	Growth 1995-2000	% Share 2000	Average HH Size
Barangay 49	318	314	75	-37%	0.09%	4.19
Barangay 50	560	554	119	-25%	0.16%	4.66
Barangay 51	1,953	1,953	397	-24%	0.55%	4.92
Barangay 52	1,758	1,758	337	10%	0.50%	5.22
Barangay 53	689	689	134	-3%	0.19%	5.14
Barangay 54	1,437	1,436	278	-17%	0.40%	5.17
Barangay 55	664	664	182	-20%	0.19%	3.65
Barangay 56	602	602	151	-32%	0.17%	3.99
Barangay 57	1,788	1,788	373	17%	0.50%	4.79
Barangay 58	1,829	1,829	414	-16%	0.52%	4.42
Barangay 59	913	849	201	-13%	0.26%	4.22
Barangay 60	1,393	1,383	285	-8%	0.39%	4.85
Barangay 61	2,157	2,157	379	-19%	0.61%	5.69
Barangay 62	1,054	1,054	229	-16%	0.30%	4.60
Barangay 63	510	510	114	-33%	0.14%	4.47
Barangay 64	1,643	1,643	320	-11%	0.46%	5.13
Barangay 65	2,888	2,888	628	-1%	0.81%	4.60
Barangay 66	2,488	2,488	507	-20%	0.70%	4.91
Barangay 67	1,404	1,404	301	-23%	0.40%	4.66
Barangay 68	616	585	122	2%	0.17%	4.80
Barangay 69	1,146	1,106	270	23%	0.32%	4.10
Barangay 70	1,000	818	174	-5%	0.28%	4.70
Barangay 71	619	619	132	-2%	0.17%	4.69
Barangay 72	1,221	1,221	260	-25%	0.34%	4.70
Barangay 73	1,006	1,006	234	-40%	0.28%	4.30
Barangay 74	499	496	144	-27%	0.14%	3.44
Barangay 75	795	785	198	-46%	0.22%	3.96
Barangay 76	**1,823**	**1,796**	**472**	**-78%**	**0.51%**	**3.81**
Barangay 77	1,667	1,667	333	-26%	0.47%	5.01
Barangay 78	230	230	47	-60%	0.06%	4.89
Barangay 79	553	546	126	-33%	0.16%	4.33
Barangay 80	756	756	137	-20%	0.21%	5.52
Barangay 81	486	486	100	-50%	0.14%	4.86
Barangay 82	358	358	80	-39%	0.10%	4.48
Barangay 83	608	608	132	-38%	0.17%	4.61
Barangay 84	535	535	110	-28%	0.15%	4.86
Barangay 85	1,208	1,208	250	27%	0.34%	4.83
Barangay 86	702	702	155	-57%	0.20%	4.53
Barangay 87	515	515	117	0%	0.15%	4.40
Barangay 88	911	911	209	-11%	0.26%	4.36
Barangay 89	465	405	95	-45%	0.13%	4.26
Barangay 90	969	969	227	-42%	0.27%	4.27
Barangay 91	1,040	1,037	227	-11%	0.29%	4.57
Barangay 92	319	319	88	-6%	0.09%	3.63
Barangay 93	453	453	93	12%	0.13%	4.87
Barangay 94	1,685	1,685	351	-34%	0.47%	4.80
Barangay 95	1,484	1,484	309	15%	0.42%	4.80
Barangay 96	825	825	159	0%	0.23%	5.19
Barangay 97	1,230	1,230	267	-13%	0.35%	4.61
Barangay 98	847	847	185	-31%	0.24%	4.58
Barangay 99	986	986	220	-34%	0.28%	4.48
Barangay 100	835	835	202	-28%	0.24%	4.13

Barangay	Total Population	Household Population	Number Of Household	Growth 1995-2000	% Share 2000	Average HH Size
Barangay 101	350	350	58	36%	0.10%	6.03
Barangay 102	566	566	117	-35%	0.16%	4.84
Barangay 103	666	665	135	-13%	0.19%	4.93
Barangay 104	954	949	192	-4%	0.27%	4.94
Barangay 105	468	468	100	-23%	0.13%	4.68
Barangay 106	1,167	1,167	238	1%	0.33%	4.90
Barangay 107	1,789	1,748	411	-8%	0.50%	4.25
Barangay 108	1,893	1,893	387	-6%	0.53%	4.89
Barangay 109	1,002	1,002	218	-6%	0.28%	4.60
Barangay 110	1,853	1,853	341	-6%	0.52%	5.43
Barangay 111	1,067	1,067	215	-17%	0.30%	4.96
Barangay 112	581	581	120	10%	0.16%	4.84
Barangay 113	1,860	1,860	409	3%	0.52%	4.55
Barangay 114	712	712	157	-23%	0.20%	4.54
Barangay 115	1,248	1,248	261	12%	0.35%	4.78
Barangay 116	1,063	1,053	222	-29%	0.30%	4.74
Barangay 117	954	954	212	-38%	0.27%	4.50
Barangay 118	1,814	1,810	408	-3%	0.51%	4.44
Barangay 119	1,202	1,202	273	-29%	0.34%	4.40
Barangay 120	418	418	97	-33%	0.12%	4.31
Barangay 121	1,112	1,112	247	-14%	0.31%	4.50
Barangay 122	1,229	1,229	262	1%	0.35%	4.69
Barangay 123	1,277	1,277	256	-23%	0.36%	4.99
Barangay 124	1,423	1,423	289	-12%	0.40%	4.92
Barangay 125	1,432	1,432	317	10%	0.40%	4.52
Barangay 126	693	693	148	-37%	0.20%	4.68
Barangay 127	1,823	1,823	364	-12%	0.51%	5.01
Barangay 128	1,144	1,132	238	1%	0.32%	4.76
Barangay 129	997	997	219	14%	0.28%	4.55
Barangay 130	3,040	3,010	684	-3%	0.86%	4.40
Barangay 131	1,145	1,145	238	-23%	0.32%	4.81
Barangay 132	2,620	2,620	500	21%	0.74%	5.24
Barangay 133	2,097	2,097	447	-2%	0.59%	4.69
Barangay 134	1,776	1,742	364	-18%	0.50%	4.79
Barangay 135	2,516	2,516	638	28%	0.71%	3.94
Barangay 136	1,626	1,626	403	-23%	0.46%	4.03
Barangay 137	2,296	2,296	516	-20%	0.65%	4.45
Barangay 138	1,519	1,519	366	73%	0.43%	4.15
Barangay 139	749	746	180	-25%	0.21%	4.14
Barangay 140	613	613	142	-22%	0.17%	4.32
Barangay 141	692	692	142	-43%	0.19%	4.87
Barangay 142	652	647	146	40%	0.18%	4.43
Barangay 143	3,807	3,807	908	27%	1.07%	4.19
Barangay 144	3,200	3,173	750	-6%	0.90%	4.23
Barangay 145	7,104	7,104	1,552	-4%	2.00%	4.58
Barangay 146	619	619	140	-28%	0.17%	4.42
Barangay 147	1,824	1,824	397	-28%	0.51%	4.59
Barangay 148	3,158	3,158	656	-11%	0.89%	4.81
Barangay 149	374	368	89	-25%	0.11%	4.13
Barangay 150	605	605	165	20%	0.17%	3.67
Barangay 151	784	784	181	2%	0.22%	4.33
Barangay 152	1,147	1,147	272	12%	0.32%	4.22

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Barangay	Total Population	Household Population	Number Of Household	Growth 1995-2000	% Share 2000	Average HH Size
Barangay 153	1,376	1,376	299	-31%	0.39%	4.60
Barangay 154	871	871	186	58%	0.25%	4.68
Barangay 155	1,090	1,085	235	32%	0.31%	4.62
Barangay 156	3,142	3,142	652	-9%	0.89%	4.82
Barangay 157	2,010	2,010	419	-27%	0.57%	4.80
Barangay 158	517	493	105	-30%	0.15%	4.70
Barangay 159	1,290	1,290	309	-17%	0.36%	4.17
Barangay 160	937	906	232	9%	0.26%	3.91
Barangay 161	2,083	2,029	524	-3%	0.59%	3.87
Barangay 162	1,278	1,278	281	-9%	0.36%	4.55
Barangay 163	897	897	203	-40%	0.25%	4.42
Barangay 164	1,525	1,525	342	-16%	0.43%	4.46
Barangay 165	3,646	3,646	803	15%	1.03%	4.54
Barangay 166	1,023	1,023	280	-23%	0.29%	3.65
Barangay 167	668	668	143	-11%	0.19%	4.67
Barangay 168	496	496	102	-11%	0.14%	4.86
Barangay 169	2,714	2,689	660	1%	0.76%	4.07
Barangay 170	1,869	1,869	382	-1%	0.53%	4.89
Barangay 171	2,969	2,969	692	-1%	0.84%	4.29
Barangay 172	4,719	4,718	1,038	-21%	1.33%	4.55
Barangay 173	1,411	1,401	309	-18%	0.40%	4.53
Barangay 174	1,299	1,295	276	-28%	0.37%	4.69
Barangay 175	1,686	1,686	383	-10%	0.48%	4.40
Barangay 176	1,532	1,532	334	-14%	0.43%	4.59
Barangay 177	4,956	4,956	1,065	0%	1.40%	4.65
Barangay 178	5,649	5,649	1,067	-21%	1.59%	5.29
Barangay 179	5,072	5,071	1,107	-8%	1.43%	4.58
Barangay 180	1,887	1,887	396	-18%	0.53%	4.77
Barangay 181	2,474	2,474	474	-6%	0.70%	5.22
Barangay 182	2,001	2,001	442	5%	0.56%	4.53
Barangay 183	29,450	29,364	6,846	-36%	8.30%	4.29
Barangay 184	9,454	9,343	2,114	-2%	2.66%	4.42
Barangay 185	4,630	4,630	1,043	-22%	1.30%	4.44
Barangay 186	4,645	4,645	959	-5%	1.31%	4.84
Barangay 187	3,971	3,951	931	1%	1.12%	4.24
Barangay 188	1,461	1,461	329	-5%	0.41%	4.44
Barangay 189	1,108	1,108	229	-17%	0.31%	4.84
Barangay 190	4,631	4,631	948	-8%	1.30%	4.89
Barangay 191	3,378	3,378	807	-30%	0.95%	4.19
Barangay 192	4,153	4,153	963	-19%	1.17%	4.31
Barangay 193	7,121	7,121	1,548	-16%	2.01%	4.60
Barangay 194	5,858	5,858	1,450	7%	1.65%	4.04
Barangay 195	1,876	1,876	414	-19%	0.53%	4.53
Barangay 196	1,653	1,653	354	2%	0.47%	4.67
Barangay 197	3,310	3,310	733	-18%	0.93%	4.52
Barangay 198	1,362	1,362	281	-1%	0.38%	4.85
Barangay 199	1,769	1,769	400	-12%	0.50%	4.42
Barangay 200	538	538	111	-31%	0.15%	4.85
Barangay 201*	14,209	14,209	3,200		4.00%	4.44

Source: National Statistics Office

**Created into a barangay under City Ordinance 83-1997; ratified on June 8, 1997; taken from Barangay 183.*

Gender Age Profile

Table 2.4.6 shows the statistical data for Household Population 5 Years Old and Over by Sex and Demography Profile indicating Age and Gender.

Table 2.4.6 Household Population 5 Years Old and Over by Sex Place of Residence 5 Years Ago of Pasay City, 1990

Sex, Place of Residence and City/Municipality	Household Population 5 Years Old And Over	Place of Residence 5 Years Before				
		Same City/ Municipality	Other City/ Municipality Same Province	Other Province	Foreign Country	Unknown
	(1)	(2)	(3)	(4)	(5)	(6)
Pasay	318,866	269,975	7,352	35,050	487	6,002
Male	155,623	133,225	3,463	15,756	314	2,865
Female	163,243	136,750	3,889	19,294	173	3,137

SOURCE: *http://www.pasay.gov.ph/Pdf/socio-eco/popLandUse3.pdf*

Table 2.4.7 Demography Profile indicating Age and Gender

A.	Demography	Total	Male	Female
1	Household	70,656		
2	Population	272,087	134,551	137,536
3	0-17 yrs old	92,626	47,418	45,208
4	0-5 yrs old	32,199	16660	15539
5	3-5 yrs old	15,862	8241	7621
6	6-12 yrs old	35,839	18,273	17566
7	13-16 yrs old	19,635	10004	9631
8	17 yrs old	4,953	2481	2472
9	10 yrs old and above	219,355	107,360	111,995
10	Member 15-49 yrs old	156,853	77,708	79,145
11	Member 15 yrs old and above	194,211	94,606	99,605
12	Labor Force	115,281	69,174	46,107
13	Senior Citizen	16,265	6,856	9,409
14	Single Parent	8,885	1,983	6902
15	OFW	4,756	3,120	1636
16	People with Disability	1,738	919	819
17	Board Passer	4,018	1,576	2442
18	GSIS & SSS Members	98,311	54,866	43,445

SOURCE: *CBMS Pasay 2011/CPDO*

Table 2.4.8 Population by Gender and by Barangay

Barangay	Male	Female	Total
Total	**134,551**	**137,536**	**272,087**
1	281	297	578
2	433	457	890
3	361	357	718
4	746	803	1,549
5	278	318	596
6	268	270	538
7	193	176	369
8	171	166	337
9	83	101	184
10	567	582	1,149
11	222	232	454
12	270	226	496
13	527	565	1,092
14	1,886	1,831	3,717
15	157	168	325
16	247	222	469
17	99	125	224
18	353	354	707
19	222	185	407
20	258	238	496
21	398	402	800
22	305	293	598
23	439	477	916
24	427	504	931
25	350	381	731
26	246	252	498
27	169	197	366
28	451	458	909
29	527	574	1,101
30	577	533	1,110
31	490	479	969
32	403	363	766
33	261	275	536
34	254	252	506
35	591	597	1,188
36	190	197	387
37	932	1,103	2,035

Barangay	Male	Female	Total
Total	**134,551**	**137,536**	**272,087**
38	635	686	1,321
39	184	185	369
40	606	563	1,169
41	182	169	351
42	707	739	1,446
43	834	817	1,651
44	416	424	840
45	373	403	776
46	882	879	1,761
47	323	313	636
48	141	139	280
49	39	50	89
50	283	289	572
51	860	880	1,740
52	752	718	1,470
53	308	315	623
54	774	796	1,570
55	191	196	387
56	198	196	394
57	112	114	226
58	326	328	654
59	144	145	289
60	481	521	1,002
61	1,159	1,125	2,284
62	524	490	1,014
63	353	372	725
64	833	841	1,674
65	1,124	1,092	2,216
66	1,055	1,135	2,190
67	534	573	1,107
68	353	358	711
69	491	510	1,001
70	191	185	376
71	251	247	498
72	590	566	1,156
73	245	261	506
74	119	127	246
75	225	222	447
76	**1,007**	**1,055**	**2,062**

Barangay	Male	Female	Total
Total	**134,551**	**137,536**	**272,087**
77	265	296	561
78	320	346	666
79	78	95	173
80	358	395	753
81	288	359	647
82	185	189	374
83	324	296	620
84	144	146	290
85	327	374	701
86	340	448	788
87	219	220	439
88	525	545	1,070
89	371	308	679
90	472	494	966
91	455	470	925
92	163	155	318
93	133	130	263
94	769	816	1,585
95	433	461	894
96	343	400	743
97	390	369	759
98	437	514	951
99	511	504	1,015
100	322	358	680
101	163	205	368
102	266	284	550
103	401	393	794
104	462	492	954
105	192	239	431
106	292	306	598
107	619	656	1,275
108	742	911	1,653
109	522	549	1,071
110	925	949	1,874
111	489	629	1,118
112	185	221	406
113	613	661	1,274
114	392	469	861
115	459	485	944

Barangay	Male	Female	Total
Total	**134,551**	**137,536**	**272,087**
116	418	471	889
117	500	509	1,009
118	218	239	457
119	319	306	625
120	185	206	391
121	421	438	859
122	454	482	936
123	449	466	915
124	479	500	979
125	758	855	1,613
126	303	294	597
127	804	796	1,600
128	305	330	635
129	390	404	794
130	1,216	1,165	2,381
131	410	401	811
132	665	707	1,372
133	690	649	1,339
134	795	730	1,525
135	1,331	1,286	2,617
136	684	767	1,451
137	859	864	1,723
138	555	501	1,056
139	397	372	769
140	269	288	557
141	217	236	453
142	111	100	211
143	1,362	1,330	2,692
144	866	843	1,709
145	1,465	1,562	3,027
146	229	217	446
147	551	610	1,161
148	792	779	1,571
149	190	211	401
150	164	230	394
151	314	330	644
152	425	472	897
153	595	606	1,201
154	273	315	588

Barangay	Male	Female	Total
Total	**134,551**	**137,536**	**272,087**
155	403	406	809
156	1,281	1,206	2,487
157	1,081	1,088	2,169
158	406	387	793
159	570	762	1,332
160	285	347	632
161	474	466	940
162	1,513	1,496	3,009
163	394	444	838
164	630	648	1,278
165	1,844	1,819	3,663
166	366	423	789
167	168	222	390
168	191	210	401
169	1,127	1,101	2,228
170	444	498	942
171	1,085	1,127	2,212
172	1,606	1,684	3,290
173	494	491	985
174	595	628	1,223
175	790	819	1,609
176	505	565	1,070
177	2,265	2,350	4,615
178	1,788	1,819	3,607
179	1,952	1,916	3,868
180	845	797	1,642
181	1,227	1,219	2,446
182	927	947	1,874
183	8,913	9,318	18,231
184	4,505	4,553	9,058
185	1,161	1,154	2,315
186	1,794	1,824	3,618
187	1,128	1,038	2,166
188	765	715	1,480
189	802	813	1,615
190	1,703	1,736	3,439
191	2,036	2,032	4,068
192	1,827	1,818	3,645
193	1,821	1,751	3,572

Barangay	Male	Female	Total
Total	**134,551**	**137,536**	**272,087**
194	2,073	2,001	4,074
195	1,055	976	2,031
196	573	562	1,135
197	1,194	1,171	2,365
198	363	377	740
199	640	702	1,342
200	406	359	765
201	6,777	6,713	13,490

SOURCE: *CBMS_Pasay 2011/CPDO*

2.4.1 Displacement of users needing access to water bodies

2.4.1.1 Displacement of Settlers

The matter is not considered germane because (a) being located in the waters of Manila Bay the site has no settlers and (b) there are likewise no existing settlers on shore at the impact areas e.g. in the access roads.

Settlements map

This is not considered germane in the absence of settlers or need for resettlement.

Census of population / property that will be displaced / disturbed

This is not considered germane in the absence of settlers, houses, properties that will be displaced or disturbed.

Housing ownership profile / availability of housing/ number of informal settlers

This is not considered germane in the absence of settlers or need for resettlement.

Change/conflict in land ownership

This is not considered germane inasmuch as no land will be involved and thus land ownership is not involved.

Change/Conflict in Right of way

As may be seen from **Section 1 Figure 1.9 page 1-18** the access to the project site are through existing roads and thus no ROW issues or conflicts are involved. The access to the site from these roads and across the water channel will be through bridges that will be built from the shore. There are no restricted sea lanes that will impede or prevent access through the Bay.

2.4.2 In–Migration/ Proliferation of Informal Settlers

The proposed project will not result in proliferation of informal settlers because when completed the reclaimed land will be operated in part by the LGU and by private developers and businesses which will not allow informal settlers. “Boat” people will also not be allowed within the immediate vicinity of the reclaimed land.

With respect to in-migration, during the reclamation/construction phase the construction crew may be based at the barges and some will be returning to their places of residence after the working hours outside the project site.

In-migration will be a natural consequence during the operations phase because of the current but tentative plan to construct residential or hotel establishments.

2.4.3 Cultural/Lifestyle change (especially involving employees in the nearby developed areas of the site and vicinity)

Demographic data and impacts on change (especially involving employees in the nearby developed areas of the site and vicinity)

There are no populations at the project site which is in the water.

Population/Employees/Businesses in the nearby developed areas of the site and vicinity

Upon the firming up of the master plan which will show more definitive land use plan for the reclaimed area, only best qualitative estimates can be made at this time.

Hotels

The Sofitel Hotel is immediately adjacent to the project site. It may be expected that occupancy will significantly increase redounding to the benefit of the hotel especially its employees and contractors (e.g. security guards, maintenance crews, etc). There are approximately 1000 to 5000 estimated employees of the Hotel.

Large Enterprises

The Mall of Asia (at Pasay City)

The expected impact is increased number of customers which redound to the benefit of the employees and business people operating at the Mall of Asia.

Small and Medium Enterprises along Macapagal Avenue

The Dampa sa Macapagal Avenue by the Libertad Channel (at Pasay City) has the following establishments:

Estimated Number of restaurants	10
Estimated Number of stores	3

Others

The Harbor View Market by the Manila Yacht Club (Manila)

Number of Restaurants	23
Number of Stores	1

Others

Small Enterprises at the Boulevard - 70 Mini stores more or less

Offices

Government:

- The Philippine Senate
- The Department of Foreign Affairs
- Government Service Insurance System (GSIS)

There may not be any effect among the employees of these offices since portion of the reclaimed area which will be given to the government may house new offices or buildings for these entities.

Schools and Hospitals

- San Juan De Dios Educational Foundation, Incorporated –approximately 21 Km away
- Sta. Rita de Baclaran Hospital – approximately 0.80 km away
- U.S. Department of Veteran Affairs Medical Clinic – approximately 0.83km away
- Baclaran General Hospital – approximately 0.82km away
- Pasay City North High School – Cuneta Annex
- Cuneta Elementary School
- Jose Rizal Elem School
- P. Villanueva Elementary School
- Asian Institute of Maritime Studies (AIMS)
- Pamantasang Lungsod ng Pasay

There may not be any effect among employees and student of these offices/schools/hospitals.

Cultural Significance and Historical Profile

Manila Bay is a historic site along with the coastline and the immediate communities. From the Famed Kingdom of Rajah Suleiman, up to the historic naval battles at the bay during World War II, Manila bay and the Baywalk has a central place in Philippine history.

Experts from the National Museum have stated that the Manila Bay area that will be affected by the project contains possible archaeological pieces and finds due to the bay being a historical centerpiece despite the bay being disturbed as it is common that bay and port are generally known to have high incidences of shipwrecks throughout history. Members of the archaeological department of the National Museum stated similar cases such as the excavations done in the ports in Hong Kong. They have pointed out the need to conduct an archaeological survey in the future to check if the area contains valuable historical artifacts.

The National Historical Commission, in their released declaration, has identified areas in Manila Bay declared as Historical Zone as extending only from Del Pan Bridge up to the CCP complex. They also stated that the present coastline was not the original coastline of the bay which originally was deeper inland. Thus the Pasay reclamation project is deemed not within the scope of the NHC.

Historical value and cultural value have to be assessed as per the perspective of NCCA and NHI (specific focus also on the Magsaysay's Presidential proclamation on the Manila Bay)

The National Historical Commission of the Philippines (NHCP) has declared certain shorelines along the Manila Bay a National Historical Landmark. However, the boundary delineated is the

shoreline from Del Pan Bridge to the Cultural Center of the Philippines. The reclamation site for this Project is therefore outside the boundaries of the National Historical Landmark. (**Annex 7.0** shows the NHCP Board Resolution)

President Magsaysay's Proclamation on the National Park reads partially but verbatim as follows:

PROCLAMATION NO. 41

RESERVING FOR NATIONAL PARK PURPOSES TO BE KNOWN AS "MANILA BAY BEACH RESORT" A CERTAIN PARCEL OF THE PUBLIC DOMAIN SITUATED IN THE CITIES OF MANILA AND PASAY AND THE MUNICIPALITY OF PARAÑAQUE, PROVINCE OF RIZAL, ISLAND OF LUZON

Upon the recommendation of the Secretary of Agriculture and Natural Resources as Chairman of the Commission on Parks and Wildlife, and pursuant to the provisions of section one of Act Numbered Thirty-nine hundred and fifteen, as amended, and of section two of Republic Act Numbered Eight hundred and twenty-six, I, Ramon Magsaysay, President of the Philippines, do hereby withdraw from sale or settlement and reserve for national park purposes to be known as "Manila Bay Beach Resort" under the administration of the Commission on Parks and Wildlife, subject to private rights if any there be, the following parcel of land of the public domain, situated in the cities of Manila and Pasay and the municipality of Parañaque, Province of Rizal, Island of Luzon, and more particularly described as follows, to wit:

Beginning at a point marked 1 on plan N. P. No. 34 being S. 40″ 48′ W., 86.24 meters from M.B.M. 1, Pasay Cadastre 259, thence N. 12° 52′ W., 727.26 meters to point 2; thence N. 15° 10′ W., 343.48 meters to point 3; thence N. 17° 34′ W., 238.63 meters to point 4; thence N. 21° 36′ W., 224.00. meters to point 5; thence N. 27° 37′ W., 216.00 meters to point 6; thence S. 61° 24′ W., 1,028.00 meters to point 7; thence S, 14° 15′ E., 1,200.00 meters to point 8; thence S. 14° 04′ E.„ 718.00 meters to point 9; thence S. 9° 02,' E., 1,200.00 meters to point 10; thence S. 8° 00′ E. 344.00 meters to point 11; thence S. 2° 14′ E., 728.00 meters to point 12; thence S. 87° 26′ E., 1,019.99 meters to point 13; thence N. 0° 24′ W., 352.00 meters to point 14; thence N. 7° 06′ W., 1,200.00 meters to point 15; thence N. 6° 36′ W., 867.00 meters to point 16; thence ' N. 9° 14′ W., 586.42 meters to the point of beginning. Bounded on the North, by Manila Bay; on the east, by Dewey Boulevard; and on time south and west, by Manila Bay. Containing an approximate area of 4,646,612 square meters, more or less.

When these coordinates in the cadastral map is plotted, the resulting coverage of the Presidential Proclamation is shown in **Figure 2.4.3.**



Figure 2.4.3 Boundaries of Presidential Proclamation 41

2.4.4 Threat to delivery of basic services /resource competition. *Resource Competition (Water Supply, Power Supply, Communications / transportation, Health resources: government and private/peace and order/crime/educational facilities/recreational and sports facilities)*

WATER SUPPLY

The sole provider for water of the Metro Manila is being served by two water concessionaires – the Manila Water Company, Inc. (MWCI), serving the east zone; and the Maynilad Water Services, Inc. (MWSI) for the west zone. Currently the water supply of the City of Pasay is being provided by Maynilad Water Services, Inc (MWSI) as Pasay is under the west zone. The water source is from La Mesa Dam, where water is filtered and treated before it is distributed to the entire franchise area. Thus there are no ground water extractions by the MWSS in the City to supply its water needs.

According to the 2011 CLUP of Pasay, the City has a total active water service connection of 32,326 while the inactive water service connection is 9,055, servicing a total of 201 barangays in Pasay City consisting of domestic/residential, commercial/industrial and institutional connections.

Table 2.4.9 illustrates for access to safe water indicator based from the 2008-2009 report of Community-Based Monitoring System (CBMS), Philippines.

Table 2.4.9 CBMS Core Indicators, Pasay City, 2008-2009 Access to Safe Water

INDICATOR	HOUSEHOLDS	
	Magnitude	Proportion
Households living without access to safe water	87	0.1

SOURCE:http://pepnet.org/fileadmin/medias/pdf/CBMS_country_proj_profiles/Philippines/poverty_maps/PasayCity.pdf retrieved on June 4, 2013

Table 2.4.10 Water Supply Coverage Targets in the Service Area West Zone (%)

City/Municipality	2001	2006	2011	2016	2021
NCR					
Manila*	100	100	100	100	100
Pasay	**100**	**100**	**100**	**100**	**100**
Caloocan	100	100	100	100	100
Las Piñas	58	91	93	95	98
Malabon	84	100	100	100	100
Valenzuela	84	100	100	100	99
Muntinlupa	53	86	88	90	95
Navotas	92	100	100	100	100
Paranaque	76	100	100	100	100
Cavite					
Cavite City	100	100	100	100	100
Bacoor	58	90	92	93	95
Imus	36	61	63	65	72
Kawit	84	100	100	100	100
Noveleta	60	100	100	100	100
Rosario	42	90	90	90	90
Total area*	**87**	**97**	**97**	**98**	**98**

SOURCE: http://www3.pids.gov.ph/ris/dps/pidsdps0014.pdf retrieved on June 4, 2013

- Expressed as a percentage of the total population in the designated city or municipality at the time of the target.
- The Concessionaire (West) shall also be responsible for meeting the new water supply coverage targets (but not the corresponding sewerage targets), in the percentages set out in the Table as it

appears in the Other Operator's (East) Concession Agreement, for parts of the following cities or municipalities in service area east: Quezon City, San Mateo, Makati, Marikina and Rodriguez.

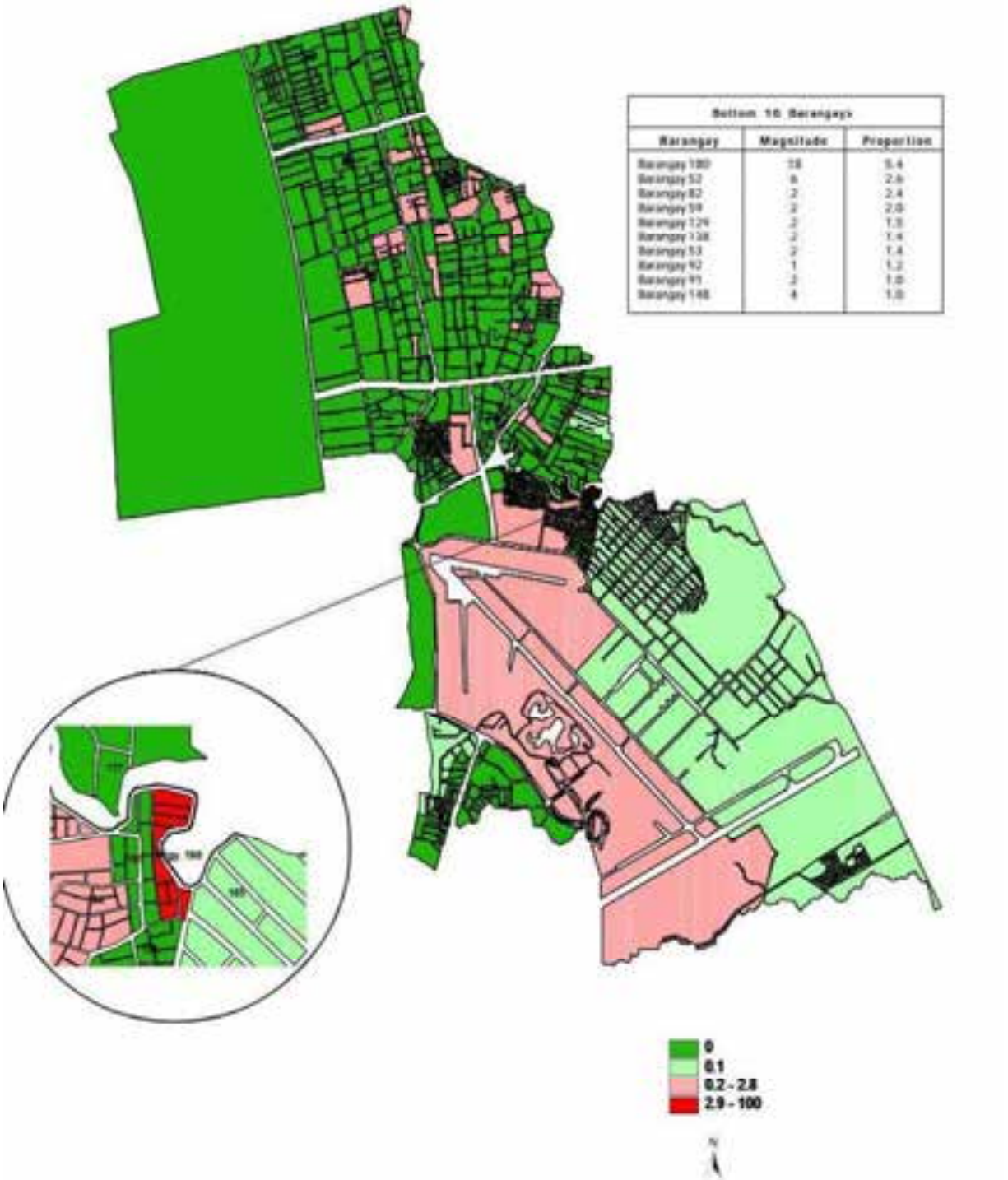


Figure 2.4.4 Households without Access to Safe Water Supply, by Barangay, 2008-2009

Water Supply Demand (Boulevard 2000)

The present population of Pasay City is less than 360,000 and the current domestic demand is around 225,000 cubic meters. Based from the 2011 CLUP, Pasay City will have a huge demand for water because of the projected demand of the Boulevard 2000. This said development can attract around 700,000 residents with a potential water demand of 450, 000 cubic meter per day and another 1 million transient daytime population (0.411 residents of the total projected) in the future. On the segregation of zones the CBP-1A will have a projected total population of 218,000 of which the residents will be around 89,898 people (based on the applied ratio). The water demands for Boulevard 2000 will double the current population of Pasay City.

With regards to the projected water demand, Umiray-Angat Trans basin is being eyed as the primary source of water. Umiray-Angat Trans basin is said to be the second stage of Angat Water Supply (AWSOP) which can benefit around 2.2 million people. The other possible sources of water are the Agos River Dam project and the Laiban Dam projects located in Quezon and Rizal provinces.

Water Resource Competition with the Communities

Although the water demand arising from the reclamation project will increase, the supply will be ensured by MWSS through its Concessionaire Maynilad Water Company and the source will be the Angat Water Supply (AWSOP), and for additional needs the Umiray-Angat Transbasin, the Agos River Dam and the Laiban Dam, among other potential projects. Thus there will be no competition on water resources.

POWER SUPPLY

The power supply of the proposed project will also be applied with a service provider. Currently, the City of Pasay power supply is being provided by Manila Electric Company, or Meralco. Meralco is the power distribution franchise for some 22 cities and 89 municipalities, including the capital city of Manila, as well as for the cities of San Juan, Las Piñas, Quezon, Malabon, Makati, Caloocan, Pasay, Mandaluyong, Paranaque, and Navotas.In Pasay, 60.77% is distributed to commercial establishments, 33.80% to households and 5.43 % to industries. The electrification statistics for Pasay City is shown in the **Table 2.4.11**.

Table 2.4.11. Power Customers for the City of Pasay

	Residential	Commercial	Industrial	TOTAL
January	54,383	7,233	69	61,685
February	54,628	7,245	69	61,942
March	54,639	6,518	71	61,228
April	56,496	7,263	73	63,832
May	59,160	7,285	71	66,516
June	59,505	7,306	70	66,881
July	60,208	7,334	71	67,613
August	60,113	7,341	72	67,526
September	60,280	7,325	71	67,676
October	60,400	7,299	71	67,770
November	60,606	7,757	75	68,438
December	60,700	7,082	72	67,854

SOURCE: From Meralco (as of March 2001)

Power Supply Demand (Boulevard 2000)

In the studies presented in the 2011 CLUP of the City of Pasay, Boulevard 2000 power load requirement for Bay City (CBPI-A) will reach around 422 MVA. This will require an additional of two (2) substations while the entire Boulevard 2000 project will require 12 substations. The power requirements of Boulevard 200 will necessitate the construction of the 230KV-115KV delivery point substation to connect with the NPC's 230 KV grid, consequently 115 KV sub-transmission lines will interlink all of the substations.

Power Resource Competition

The resulting increased power demand for the project as well as generally for the entire country which will results from increased economic developments are being already addressed through several planned new power plant projects e.g.

- The 230 MW Calaca Coal Power Plant
- The 600 MW Subic Bay Coal Power Plant
- New Gas Power Plants in Region IV
- Expansion of Hydropower Plants
- Several others

Thus the requirements of the project for power supply will not compete with the City. In addition, the establishments/locators may use own off-grid power source such as from solar panels.

COMMUNICATIONS

At present the City of Pasay avail of services from different communication providers such as Philippine Long Distance Telephone (PLDT) Company, Smart Communications, Globe telecom etc.,

Communications Resource Competition

The communications companies are continuously embarking on expansion of its facilities for both the mobile and land line telephone systems. For the latter use of fiber optics will be expanded.

TRANSPORTATION

In terms of transportation, the proposed project will provide opportunities for much bigger transportation services that will enable safe and efficient movements of people on the roads.

This has been clearly demonstrated in the ongoing projects along the coast of Manila Bay whereby the increase of passengers are being met by corresponding increase in transportation facilities, e.g., in the case of the recently opened Solaire Casino Complex along the shores of Manila Bay.

In totality, the City of Pasay provides adequate supply of electricity and water, excellent communication facilities and good access on road transportation.

2.4.5 Threat to Public Health and Safety

Peace and order / Crime / Crime rate

Crime is said to be often outcome of the contributing factors of poverty and drug addiction. These factors have the need to be addressed as well with the enforcing of protective regulations.

Based from the Socio-Economic Profile of City of Pasay, Pasay has a total of 387 police personnel managing the peace and security of about 444, 027 projected populations in year 2001. The police ratio is 1:1,147.

Table 2.4.12 Protective Services PNP Note: as of April 3, 2001		
Non-uniform (civilian)	21	
Non-officers (from PO1-SPO4)	344	
Officers (from Inspector – Superintendent)	43	
TOTAL	**408**	
	1999	**2000**
Crime Index	487	467
Non Index	591	390
Crime Volume	1078	857
Crime Solved	1019	850
Crime Solution Efficiency	94.50%	99.80%
(volume/solved)		
Ave. monthly crime rate (AMCR)	22.30	22.28
Ave. Monthly Index Crime Rate (AMICR)	12.77	12.26
Ave. Monthly Non-Index Crime Rate	15.50	10.24
(per 100,000 population)		

Source: 2011 Comprehensive Land Use Plan (CLUP) of Pasay

The proposed project will pose no unmanageable threat to public safety as the project will provide full security and safeguards within the vicinity to ensure that the people will have no risk that the proposed project will directly bring about. The fact alone that the various activities/businesses are to be confined physically to a clearly bound area makes it easier to manage safety concerns compared to a case where such activities/businesses were to be scattered in different parts of the City. The Manila Bay will also provide a safeguard against intrusion of criminal elements.

Moreover in terms of design or building heights, the proposed project is subject to the boundaries set by engineering designs and construction methodologies. Regulations and prescribed codes will be strictly implemented.

Environmental Health and Sanitation Profile/Health Resources (Government and Private)

The proposed project will not cause concerns on public health since the reclamation activities will not generate any toxic and hazardous substances that will threaten people or cause certain illnesses.

Moreover, the City of Pasay possesses good and stable health indicators. Also, it has a sufficient number of tertiary hospitals both public and private. The initial ratio estimate of the City's bed capacity is 1 bed per 648 population for instance, the San Juan de Dios hospital which is considered the biggest private hospital that has a 230-bed capacity and Manila Sanitarium.

Provided in the succeeding tables are the Health Indicators, Hospitals, Health Centers, 2000 and City Health Office Workforce of Pasay City.

Table 2.4.13 Health Indicators, 1996-2000 (per 1,000 population)

Indicators	1996	1997	1998	1999	2000	Average	Philippines
Crude Birth Rate (live births)	23.6	22.5	20.1	21	23	22.0	26.2
Crude Death Rate	4.6	4.7	4.4	4.5	5	4.6	5.8
Infant Mortality Rate (live births)	17.1	18.6	18.3	18.1	15	17.4	17.0
Maternal Mortality Rate (live births)	0.2	0.2	0.24	0.2	0.3	0.2	0.9

Note: Philippine figures for CBR and CDR is year 2001, for IMR and MMR is year 1997
Source: City Health Office and Department of Health

Table 2.4.14 Hospitals, 2000

Name of Hospital	Location	ABC	Classification	Category
PRIVATE				
San Juan de Dios Educational Foundation, Inc.	2772 Roxas Blvd.	230	General	Tertiary
Manila Sanitarium and Hospital	1975 Donada St.	150	General	Tertiary
Miraculous Medal Hospital	*NA*	42	NA	NA
Pasay Doctors Polyclinic	Protacio St.	NA	NA	NA
Balbido's Clinical Laboratory		NA	NA	NA
Pasay Paranaque Chest Clinic	NA	NA	NA	NA
GOVERNMENT				
Pasay City General Hospital	P. Burgos St.	100	Charted City	Secondary
Dona Marta Lying-in Clinic	37 Don Carlos Revilla	25	NA	NA
Air Force General Hospital	Villamor Air Base	150	NA	NA
	Total	**647**		

Source: City Health Office and Department of Health

Table 2.4.15 Health Centers, 2000

Health Center	Barangay	Estimated Population Served
DISTRICT HEALTH OFFICE I		
Cuyegkeng	Bgy 1 to 18 & 20	27,544
Leveriza	Bgy. 19;21 to 40	29,219
San Isidro	Bgy. 41 to 67	46,388
Main	Bgy. 68 to 92	31,366
Ventanilla	Bgy. 93 to 119 ; 121 to 126	44,386
M. dela Cruz	Bgy. 12;127 to 143	31,647
TOTAL		**210,550**
DISTRICT HEALTH OFFICE II		
Dona Marta	Bgy. 145;151 to 187&190	36,565
Malibay	Bgy.144;158 to 177	44,557
San Pablo	Bgy.178 to 177	78,078
Kalayaan	Bgy.201	17,133
MIA	Bgy.191 to 200	32,466
TOTAL		**208,799**

Source: City Health Office and Department of Health

Table 2.4.16 City Health Office Workforce, 2000

Type	Number	Ratio to Population in Pasay	Ratio to Population in Philippines	Ratio to Population in NCR
Physicians	24	17,473	27,707	20,533
Dentist	17	24,668	52,218	30,576
Nurses	23	18,233	17,465	19,474
Midwives	57	7,357	5,389	13,210
Nutritionist	3	139,783		
Med-tech	8	52,419		
Sanitary Inspectors	10	41,935		
Lab. Aides	10	41,935		
Pharmacist	1	419,349		
Utility	16	26,209		
Drivers	5	83,870		

Source: City Health Office and Department of Health and from Computations by Consultants

Mortality / Morbidity

The leading cause of diseases of Pasay City is dermatologic followed by EENT sicknesses and nutritional deficiency. The City also has a high number of pulmonary tuberculosis, suggesting problems of City on air pollution.

The leading cause of death is diseases of the heart followed by vascular diseases, pneumonia and accidents have higher morbidity rates than the country. The city also has a high cancer rate, hypertension diseases and septicemia.

Table 2.4.17 Leading Causes of Morbidity, 5-Year Average, 1996-2000

Diseases	Number	Rate/ 10,000
1. Dermatologic	5,388	138.5
2. EENT	3,399	87.4
3. Nutritional Deficiency	3,362	86.4
4. Respiratory	2,867	73.7
5. Gastro- intestinal	2,648	68.1
6. Genito- urinary	2,357	60.6
7. Muscoloskeletal	1,222	31.4
8. Pulmonary Tuberculosis	1,087	27.9
9. Other Acute Viral Illness	396	10.2
10. Other Infectious Diseases	307	7.9

Source: City Health Office and Department of Health

Table 2.4.18 Leading Causes of Mortality, 5 Year Average, 1996-2000

Diseases	Number	Rate/ 10,000
1. Diseases of Heart	272	6.9
2. Vascular Diseases	236	6.1
3. Pnuemonia	230	5.9
4. Cancer	152	3.9
5. Accidents	133	3.4
6. TB all Forms	105	2.7
7. Hypertension Diseases	102	2.6

Diseases	Number	Rate/ 10,000
8. Septicemia	49	1.3
9. Unknown/ undetermined	42	1
10. Diabetes	25	0.7
11. Bronchial asthma	25	0.7

Source: City Health Office and Department of Health

Common Diseases in the Area

The above data on morbidity and mortality also reflects common diseases in the project area considering that (a) the City of Pasay is small both in land area and population and thus the data would reflect that in the general parts of the city and (b) There are no permanent population within the project site and instead the population is mostly transient, i.e. guests in hotel and in business/commercial establishments, conventions and tourists.

EDUCATION FACILITIES

Literacy rate, Profile of educational attainment

- **Elementary**

Elementary education is the beginning of the intellectual formation of a person through formal education. Under the Department of Education (DepEd) the City of Pasay provides 19 public elementary schools (ES) which is divided into four (4) districts. A total of 44% of the total enrollment for school year 2000-2001 and considered as the biggest among the other districts is the South district. On the other hand, Villamor Air Base Elementary School that belongs to the South district is considered as the biggest elementary school with regards to the enrollment having a total of 6, 600 students.

Moreover, the City of Pasay is consists of 17 private schools. St. Mary's Academy is considered as the largest private elementary school with 34% of the total ES enrollment.

Maricaban and Kalayaan Elementary School are the only schools that exhibit critical shortage in terms of adequacy of teachers. The overall city division of city school projects a total of 107 teachers needed both public and private ES.

In terms of number of classrooms, there is no need for additional classrooms since the present ratio is way below the standard requirements. Furthermore, Pasay City's elementary schools performance is better than the rest if the country. This means that the city has less drop-out, better transition rate, more teachers and better results though the city is poor in terms of participation rate and achievement rate.

Table 2.4.19 Public Elementary Schools, 2000

Districts /Name of School	Location	Number of Teachers	Enrollment 2000-2001	Ratio
North District		163	4,791	29
1 Bernabe ES	Bernabe St.	18	355	20
2 Epifanio Delos Santos ES	Tramo St.	41	1,211	30
3 P. Burgos ES	P. Burgos St.	64	2,236	35
4 Rafael Palma ES	Dominga St.	40	989	25

Districts /Name of School	Location	Number of Teachers	Enrollment 2000-2001	Ratio
East District		326	9,458	29
1 Juan Sumulong ES	M. dela Cruz St.	75	2,026	27
2 Marcela Marcelo ES	Ascaño St., Malibay	71	1,800	25
3 P. Zamora ES	P. Zamora St.	77	2,236	29
4 TimoteoPaez ES	Apelo Cruz. St., Malibay	103	3,396	33
West District		193	5,036	26
1 A. Bonifacio ES	Leveriza St., corner Buendia Avenue	49	1,275	26
2 Gotamco ES	Sinciego St.	42	1,214	29
3 Jose Rizal ES	Galvez St., corner Park Avenue	84	2,098	25
4 P. Villanueva ES	P. Villanueva St.	18	449	25
South District		392	15,085	38
Apelo Cruz ES	E. Rodriguez St., Malibay	42	1,376	33
Cuneta ES		22	753	34
Don Carlos ES	-	24	59	32
Maricaban ES	St. Francis St., Maricaban	15	1,010	67
Kalayaan ES	Teachers Bliss Compound, Kalayaan Village	63	3,580	57
Rivera Village ES	Marigold St., Rivera Village	31	987	32
Villamor Air Base ES	Villamor Air Base	195	6,620	34
Total		1,074	34,370	32

Source: *2011 Comprehensive Land Use Plan (CLUP) of Pasay*

Table 2.4.20 Private Elementary Schools, 2000

	Name of School	Level	Address	Enrollment
1	Betty's Vermillon Academy	PES	2447 Aurora St., Pasay City	307
2	Blessed Elena Academy	PES	146 Villaruel St., Pasay City	510
3	Christ The King Aca. (formerly Christian Life Aca.)	PES	2562 Zamora St., Pasay City	72
4	Gideon Academy	PES	2683F.B.HarrisonSt.,PasayCity	198
5	Golden Treasure Baptist Academy	PE	2909 E. Rodriguez St., Malibay, Pasay City	74
6	Integrated Montessori	PE	E-B Jusmag Southside, Ft. Bonifacio, Pasay City	
7	Ma. Montessori Children's School Found., Inc.	PE	50 William St. cor. F.B. Harrison, PasayCity	177
8	Pasay City Academy	ES	2059 Donada St., Pasay City	319
9	Pasay Alliance Christian School	PES	533 Cementina St., Libertad Ext., Pasay City	74
10	Philippine Pasay Chung Hua Academy	PES	2269 Luna St., Pasay City	792
11	Rizal City School	PES	M. dela Cruz St., Pasay City	100
12	St. Mary's Academy	PES	P.BurgosSt.,PasayCity	2,486
13	St.Therese Parochial School	PE	Manlunas St., Villamor Air-Base, Pasay City	347
14	San Isidro Catholic School	PES	1830 Taft Avenue, Pasay City	560
15	San JuanNepomucenoSchool	PE	826 Apelo Cruz Ext.,Malibay,Pasay City	342
16	St. Mary of the Steps School (Scuola Madonna)	PE S	92C.JoseMalibaySt.,PasayCity	219
17	Southeastern College	PESCV	College Road, Taft Avenue, Pasay City	830

TOTAL	**7,407**

Source: *2011 Comprehensive Land Use Plan (CLUP) of Pasay*

- **High School**

For the Secondary level of education, there are four (4) schools in Pasay City having a total of 16, 600 enrollments. On the other hand, fifteen (15) private schools are offering in the City. The largest in terms of enrollment is Jose Abad Santos HS with 21% of the enrollment.

The city has no shortage in classrooms as they remain better than the accepted ratio 1:40. Instead, there are about 49 teachers needed for high school, both in public and private schools.

With regards to the high school's performance, Pasay has better participation rate, drop-out rates, teacher-student ratio, literacy rate and NSAT though the city's secondary schools are worse in transition rate, completion rate and achievement rate.

Table 2.4.21 Public High Schools, 2000

	Name of School	Location	Enrollment
1	Pasay City North HS	Tramo St., Pasay City	2,182
	PCNHS Cuneta Annex	Park Avenue, Pasay City	
2	Pasay City East HS	Malibay, Pasay City	3,965
3	Pasay City West HS	F.B. Harrision, Pasay City	5,204
4	Pasay City South HS	Villamor Air Base, Pasay City	5,304
TOTAL			**16,655**

Source: *2011 Comprehensive Land Use Plan (CLUP) of Pasay*

Table 2.4.22 Private Secondary Schools, 2000

	Name of School	Level	Address	Enrollment
1	Jose Abad Santos High School (Arellano Univ.)	S	3058 Taft Avenue, Pasay City	1,719
2	A. Mabini High School (Arellano Univ.)	S	Taft Avenue, Pasay City	548
3	Betty's Vermillon Academy	PES	2447 Aurora St., Pasay City	51
4	Blessed Elena Academy	PES	146 Villaruel St., Pasay City	421
5	Christ The King Aca. (formerly Christian Life Aca.)	PES	2562 Zamora St., Pasay City	55
6	Gideon Academy	PES	2683F.B.HarrisonSt.,PasayCity	96
7	Lacson College	SC	2188F.B.HarrisonSt.,PasayCity	146
8	Pasay Alliance Christian School	PES	533 Cementina St., Libertad Ext., Pasay City	37
9	Philippine Pasay Chung Hua Academy	PES	2269 Luna St., Pasay City	411
10	Pasay City Academy	ES	2059 Donada St., Pasay City	267
11	Rizal City School	PES	M. dela Cruz St., Pasay City	222
12	St. Mary's Academy	PES	P. Burgos St., Pasay City	1,302
13	San Isidro Catholic School	PES	1830 Taft Avenue, Pasay City	259
14	Sta. Clara Parish School	S	2360 P. Burgos St., Pasay City	1,300
15	St. Mary of the Steps School (Scuola Madonna)	PE S	92 C. Jose Malibay St., Pasay City	64
16	Southeastern College	PESCV	College Road, Taft Avenue, Pasay City	1,294

Name of School	Level	Address	Enrollment
TOTAL			**8,192**

Source: *2011 Comprehensive Land Use Plan (CLUP) of Pasay*

Table 2.4.23 Performance Indicators of Public Schools, 1997-2000

Elementary	CY- 97	CY- 98	CY- 99	CY- 2000	AVE	PHIL
Enrollment	33,699	34,092	33,993	34,310	34,310	
1. Participation Rate	78.06	79	94.57	93.32	86	96.34%
2. Retention Rate	94.46	93.02	94.57	84.38	94	NA
3. Drop- out Rate	1.48	1:11	1.5	1.30	1	7.98%
4. Survival Rate	70.75	71.54	90.50	91.00	91	68.56%
5. Transition Rate	92.85	96.64	96.19	96.48	96	95.25%
6. Completion Rate	92.45	92.16	97.18	93	95	68.06%
7. Graduation Rate	94.13	96.31	95.84	97.43	97	NA
8. Teacher- Student Ratio	32	32	32	32	32	34.38
9. Literacy Rate	**92.20**	**96.99**	**96.64**	**97**	**97**	**NA**
10. Achievement Rate	69.75	76.96	55.78	68.50	70	73.2%
11. Student- Textbook Ratio	1	1	1	1	1	NA
12. NEAT	58.44	61.3	53.97	N/A	58	46.86
Secondary						
Enrolment	16,251	16,850	15,923	16,458	15,923	
1. Participation Rate	56.02	57.70	84.49	86.28	84	64.68%
2. Retention Rate	92.62	86.26	98.99	94	93	NA
3. Drop- out Rate	8.94	7.78	7.05	6.56	7	10.59%
4. Survival Rate	83.06	74.1	89.67	91%	74	71.78%
5. Transition Rate	97.71	98.78	100%	100%	98	100.19%
6. Completion Rate	94.47	92.10	95.5	93	94	69.62%
7. Graduation Rate	80.37	93.04	95.87	95.25	80	NA
8. Teacher- Student Ratio	32	32	31	31	32	34.875

Elementary	CY- 97	CY- 98	CY- 99	CY- 2000	AVE	PHIL
9. Literacy Rate	**100%**	**100%**	**100%**	**100%**	**100%**	**95.38**
10. Achievement Rate	42.06	62.48	58.55	57.24	42	94.76%
11. Student- Textbook Ratio	1	1	1	1	1	NA
12. NSAT	58.16	53.52	58.69	-	58	46.44

Source: *2011 Comprehensive Land Use Plan (CLUP) of Pasay*

Cursory indicators of Literacy Rate are shown in the above table.

- **Tertiary**

Lacson College and Southeastern College are the two private colleges in Pasay beside from the public university that Pasay provides located at the back of City Hall named Pamantasan ng Pasay.

Food Security

On a generic and macroscopic scale:

FAO defines food security as follows : Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life The World Health Organization defines three facets of food security: food availability, food access, and food use. In assessing supply and demand situations the following factors have to be considered. (Former DOST Secretary Dr. William Padolina)

- Productivity to ensure supply
- Distribution- ensure access at affordable costs
- Transnational interdependence

Food security is linked to basic needs of housing, water supply, sanitation, and health care. Food security is threatened when there are threats to agriculture principally:

- Land degradation
- Limits to water availability
- Loss of biodiversity
- Declining agricultural genetic diversity
- Climate change
- Pests and diseases

On the Reclamation Project Scale

The reclamation project will have no impact on Food Security at the City/Community Level and on the National Level for the following reasons:

- The project does no impact on food production such as agriculture.
- There will be no significant impact on the economically important marine species at the impact areas because of the absence of significant population of these species.
- The project will not impact on agricultural genetics, pests and diseases.
- Climate change, currently recognized as a major threat to food security will not be impacted on by the project.

2.4.6 Generation of Local Benefits from the Project

- Enhancement of employment and livelihood opportunities
- Increased business opportunities and associated economic activities
- Increased revenue of LGUs

Employment rate/ profile

In the year 2000, Pasay City estimated labor force of is 291,800 representing 80.4% of the population. In spite of its highly urbanized character as evidenced by its numerous service enterprises, Pasay City had only 84.5% of its total labor force gainfully employed. Most of those employed worked for various enterprises, corporate firms and government agencies. There was also a significant number of those working which were considered self-employed.

Sources of livelihood

Pasay City's rapid urbanization has seen the decline of traditional industries and their replacement with more service-oriented types of livelihood and industries. The rising population and the growing demand for their immediate needs have caused too much pressure on land and the surrounding environment. The demand for space and the subsequent invasion of creeks and rivers by informal settlers has eased out vegetable farming, fishing, livestock raising and the culture of marine products. The recent trend towards a global-oriented economy had various impacts in the Philippines as the system promoted consumerism that created a demand for service-oriented industries. In Pasay City, such service industries took the form of financial services, medical services, retail and general merchandising, recreation services, public terminals, commercial garages, professional services, personal services, utility services, and light manufacturing. In 2000, a total 8,461 enterprises were registered in the city. See **Table 2.4.24.**

Table 2.4.24 Classification of Industries in Pasay City, 2000

Business Classification	Number	Percent to Total
General Merchandising and Retail	4,792	56.6%
Professional Services	1,394	16.5%
Utility Services	762	9.0%
Financial Services	462	5.4%
Rest and Recreational Business Services	339	4.0%
Personal Services	258	3.0%
Allied	209	2.5%
Manufacturing/Fabrication	168	2.1%
Public Terminals and Commercial Garage	41	0.5%
Private Learning Institutions	36	0.4%
Total	**8,461**	**100.0%**

Main Sources of Income

Commercial establishments and activities
Banking and financial institutions

Of the numerous industries recorded in 2000, the general merchandising and retail sector had the biggest share with a total of 4,792 enterprises. This sector was dominated by retail and general merchandising with 1,964 and sari-sari stores with 1,346. The others were dealer/trading marketing, restaurants / fast foods, food chains, bakeshops and those engaged in export activities.

The numbers presented below may even be more as inspections by the city government often reveal that there are several micro-enterprises operating without business licenses.

Table 2.4.25 Profile of General Merchandising and Retail in Pasay City, 2000

General Merchandising And Retail Sector	Number of Establishments	Percent of Sector Total	Percent of Industry Total
General Merchandise & Retail	1,964	41.0%	23.2%
Sari-sari Store	1,346	28.0%	15.9%
Food Chain Outlets	522	10.9%	6.2%
Dealer/Trading and Marketing	458	9.6%	5.4%
Export/Import	180	3.8%	2.1%
Restaurants/Fast foods	166	3.5%	2.0%
Bakeshops	156	3.2%	1.9%
Sector Total	**4,792**	**100.0%**	**56.7%**

To illustrate the growth of commercial establishments and activities and the banking and financial institutions the successful case of the reclamation which gave rise to the Mall of Asia and adjacent areas.

Poverty Incidence

The key indicators of poverty incidence are related to food needs, access to safe water and educational attainment. Available data on national and local levels are poverty threshold in relation to food.

Poverty Threshold is the annual per capita amount to be spent to satisfy one's nutritional requirements (2,000 calories) and other basic goods in a year. A person is considered poor if he lives below the annual per capita poverty threshold

The Per Capita Poverty (Food) Threshold based on the 08 February 2011 paper titled *"2009 Official Poverty Statistics"* of Dr. Romulo A. Virola, Secretary General, National Statistical Coordination Board (NSCB) shown in **Table 2.4.26** shows the relative poverty incidence among families among the various regions in the country.

Table 2.4.26 Per Capita Poverty (Food) Threshold and Poverty Incidence

	Per Capita Poverty (Food) Threshold (PhP)			Poverty Incidence among Families (%)		
	2006	2009	2012	2006	2009	2012
PHILIPPINES	**6,703**	**8,448**	**9,385**	**23.4**	**22.9**	**22.3**
NCR	**7,718**	**9,456**	**10,084**	**2.8**	**3.7**	**3.8**
Region I	7,086	8,729	9,224	23.3	18.5	16.7
Region II	6,984	8,566	9,503	22.0	22.3	19.8
Region III	7,344	9,251	10,121	13.0	12.5	12.2

Region IV-A	6,611	8,481	9,601	10.1	10.8	11.2
Region IV-B	6,238	7,751	8,527	34.1	30.6	28.4
Region V	6,618	8,420	9,022	36.2	36.5	34.1
Region VI	6,421	8,153	8,957	27.5	26.7	24.7
Region VII	7,269	8,648	9,296	35.0	31.6	28.8
Region VIII	6,266	8,107	8,989	33.3	36.2	37.2
Region IX	6,159	8,053	8,881	41.0	41.5	36.9
Region X	6,450	8,456	9,604	35.1	35.4	35.6
Bukidnon	6,515	8,588	10,048	40.4	38.8	43.3
Camiguin	5,878	7,834	9,290	27.4	17.2	34.9
Lanao del Norte	6,285	8,302	9,467	36.4	40.4	42.5
Misamis Occidental	6,030	7,941	8,985	37.2	40.1	36.6
Misamis Oriental	6,737	8,861	9,566	29.3	29.0	25.0
Region XI	6,721	8,547	9,927	26.9	27.3	28.6
Region XII	6,619	8,126	9,243	34.7	31.1	37.5
Caraga	6,996	8,905	9,779	43.3	43.3	34.1
ARMM	6,319	8,257	10,027	43.0	42.0	46.9

Source: "2009 Official Poverty Statistics" of Dr. Romulo A. Virola

In 2002 the 4th district of the NCR (Las Pinas, Makati, Muntinlupa, Paranaque, Pasay City, Pateros and Taguig) posted the second lowest poverty incidence in the country shown in **Table 2.4.27.**

Table 2.4.27 Least Poor Provinces in Year 2000

Province	1997	2000	Inc./Dec (%)	Rank 97	Rank '00
2nd District, NCR	4.5	4.1	(0.3)	81	81
4th District, NCR	4.6	4.9	0.3	79	80
Bulacan	8.3	5.4	(2.9)	73	79
1st District, NCR	5.7	5.8	0.1	78	78
Batanes	8.7	7.5	(1.2)	72	77
Rizal	8.3	8.0	(0.2)	74	76
Laguna	12.3	8.6	(3.7)	71	75
3rd District, NCR	4.6	9.0	4.4	80	74
Bataan	7.7	9.9	2.3	76	73
Cavite	8.0	10.2	2.1	75	72

Source: Social Sectors B Division, NSCB

However in the Report "State of Local Development, Electronic Report Pasay City, PY 2009" Pasay City declared that:

"Poverty incidence is high and many families are below poverty threshold".

Impacts of the Project on Poverty Incidence

Whatever may be the statistics on the Poverty Incidence for Pasay City, the benefits of the Project will help in addressing this common issue in all regions of the Philippines.

Economic-Socio Benefits From the Project Envisioned by the City

During the Public Hearing the Honourable Mayor highlighted the benefits that the Project will bring to the City/Communities (**Annex 14.0**) which include among others:

- **Adoption of ordnance such that at least 50% of income from the reclaimed area for social services, livelihood, & pro-poor programs**
- **At least 25% of income to environmental projects, including the cleanup of Manila Bay**
- **Creation of a fisherman's wharf**

2.4.7 Traffic congestion

As explained during the Public Hearing the reclamation project is not aimed to improve or solve traffic congestion but instead the resulting traffic issues arising from the project will be addressed sufficiently. It was noted that for business considerations alone, traffic congestion will be self-defeating for the commercial and business establishments to be put up in the reclaimed land.

Impact on the traffic along Roxas Boulevard and related roads and streets

Transportation in Pasay City is primarily road based. The city's road network which is composed of national, city, *barangay*, and private roads, facilitates the movement of goods and people in and out of the city. The upkeep of national roads is done by Department of Public Works and Highways (DPWH), while the maintenance of city roads is the responsibility of the City with some support from Special Local Road Fund through the Department of Interior and Local Government (DILG). The national roads provide the structure of the network while the city roads provide accessibility in the *barangays*.

Roxas Boulevard

The project site is situated near Roxas Boulevard. **Roxas Boulevard**, also referred to as the Radial Road 1 (R-1), provides north-south intra-metropolitan connections extending from the city of Manila to the Alabang-Zapote Road/ R-1 junction in Muntinlupa City. It has eight lanes (24 meters) with traffic that is predominantly composed of passenger cars, public utility vehicles, and buses. The **Roxas Boulevard East Service Road** fronts the commercial establishments east of Roxas Boulevard and has an road right of way (RROW) of six meters from with the City of Manila to EDSA intersection; the RROW increase to 12 meters from EDSA to the Redemptorist Road intersection.

Roads in the Reclamation Area

Access to and in the vicinity of the reclamation area is provided by the roads indicated in **Table 2.4.28.** All these roads have concrete pavements and are in good passable condition.

Table 2.4.28 Inventory of Roads in the Bay City (in km), length and width, 2011

Road name	Concrete	Asphalt	Total length (in km.)	Width (in meters)
President Diosdado Macapagal Blvd.	2.300	-	2.3	20
Jose. W. Diokno Avenue	1.400	-	1.4	15
Seaside Boulevard	3.100	-	3.1	12
Coral Way	1.200	-	1.2	10
Ocean Drive	1.200	-	1.2	10
Pacific Dive	.800	-	0.8	10
Marina Way	.380	-	0.38	10

Source: CEO

Roads Traffic

Major traffic generators in the city include the high-density residential and commercial developments in the existing reclamation area and along major arteries.

One of the roads that have the highest traffic volume outside the airport area is Roxas Avenue. The characteristics of traffic differ according to roads such as those leading to business centers in the metropolitan, i.e. Sen. Gil Puyat Ave., and Roxas Boulevard.

Roxas Boulevard is characterized as having one of the considered highest traffic volumes recorded in the city. It has also one of the highest public utility vehicle traffic, i.e. UV express and public utility jeepney (PUJ) in the city.

From 2010 to 2011, where comparable data are available, traffic grew 6 to 7 percent.

The Volume Capacity Ratio (VCR) of the road is an index that determines the level of service of the road. A VCR of 1.0 means that the volume of traffic on the road already equaled the capacity and indicates deterioration in the roads level of service. (See **Table 2.4.28**)

Road network/system

Based from the 2011 CLUP of the City of Pasay, the existing key roads of Pasay City that are relatively in good condition serves as the metropolitan linkage functions. In the north-south intro-metropolitan and intra-regional connection is the Radial Road 1 (R-1). R-1 is provided by the eight-lane Roxas Boulevard/ Manila-Cavite Coastal Road (MCCR) extending from the city of Manila's southernmost area to the Alabang-Zapote Road/ R-1 junction in Muntinlupa City. Epifanio De Los Santos Avenue (EDSA) mainly known as the Circumferential Road 4 (C-4). The complete list of the major thoroughfares that are actually situated within Pasay City's boundaries are provided. The transportation network is shown in **Figure 2.4.5.**



Figure 2.4.5 The transportation network of Pasay

- **Radial Road 1**

  R-1 is the link of Pasay City to the city of Manila on its north and Paranaque City on its south. It is consists of the southernmost section of Roxas Boulevard with 60 meters approximate road right-of-way (ROW). Only private transportation or a low-occupancy vehicle (LOV) passed by the area. On its south is the Public buses can pass by via Coastal Road that uses only certain segment of Roxas Boulevard and turn left at EDSA or Gil Puyat Avenue.

- **Radial Road 2**

  R-2 is consists of the southernmost section of Taft Avenue. This also link Pasay City to Manila on its north and Paranaque City on its South. The approximate road ROW is 30 meters. Unlike R-1, R-2in Pasay City is a public transportation corridor or medium-occupancy vehicle (MOV) corridor frequented by intra-metropolitan jeepneys and some mega-taxis. The Light Rail Transit (LRT) train runs along this corridor within Pasay City.

- **Radial Road 3**

  R-3 is comprised of a section of the South Luzon Expressway (SLEX). It also links Pasay City to the city of Manila on its north and to Parañaque City on its south. R-3 approximate road ROW is 60 meters. Basically a public transportation corridor or high occupancy vehicle (HOV) corridor frequented by metropolitan and provincial buses and intra-metropolitan jeepneys and mega-taxis.

- **Circumferential Road 3 (C-3)**

  C-3 links Pasay to Makati City to the east. The westernmost section of C-3 is Sen. Gil Puyat Avenue having a ROW of about 40 meters. The C-3 section found in Pasay City is a public transportation or HOV corridor from the Makati City boundary up to the up to the Boulevard 2000 Project area.

- **Circumferential Road 4 (C-4)**

  C-4 connects Pasay to Makati on is east. It has an approximate road ROW of 60 m, consists of the westernmost section of (EDSA). The C-4 section in Pasay City is the public transportation or HOV (high occupancy vehicle) corridor from the Makati City boundary up to the C-4/ R-2 junction (Pasay Rotunda). This section is frequented by metropolitan and provincial buses and intra-metropolitan jeepneys and mega-taxis and is also a largely private transportation or LOV corridor from the C-4/ R-2 junction (Pasay Rotunda) up to the vast reclaimed areas west of R-1. The Metro Rail Transit (MRT) runs along the segment of EDSA which is in Pasay with the south terminal found at the intersection of Taft Avenue and EDSA.

- **F.B. Harrison Avenue**

  F.B. Harrison Avenue is a major north-south collector road. This road also links Pasay City to the city of Manila on its north and to Parañaque City on the south (where it joins with Quirino Avenue). It has a ROW of approximately 25 meters. The F.B. Harrison Avenue section found in Pasay City is a public transportation or MOV (medium occupancy vehicle) corridor and is frequented by intra-metropolitan jeepneys and mega-taxis.

- **Arnaiz Avenue (formerly Libertad)**

  Arnaiz Avenue is a major west-east collector road that links Pasay City to Makati City on its east. The approximate road ROW of Arnaiz Avenue is 25 meters. The Arnaiz Avenue section found in

Pasay City serves as a public transportation road or MOV corridor, i.e., frequented by extra-city and intra-city jeepneys.

- **Ninoy Aquino Avenue**

The Ninoy Aquino Avenue is the last major north-south collector road. This links Pasay City to Parañaque City to the south. It has an approximate road ROW of 40 meters. The Ninoy Aquino Avenue section found in Pasay City is basically a public transportation or MOV corridor, i.e., frequented by extra-city jeepneys and mega-taxis.

- **Andrews Avenue**

Andrews Avenue is a major east-south local road functioning as a metropolitan linkage between Pasay City and Makati City by way of crossing R-3 (SLEX). The approximate road ROW is 40 meters. A section found in Pasay City is basically a private transportation or LOV corridor, i.e., frequented by private vehicles and a limited volume of extra-city jeepneys and mega-taxis.

- **Mexico Road (sometimes called Taft Avenue Extension)**

Mexico Road is a major local road that links Pasay City to Paranaque City to the south where it joins Quirino Avenue. The approximate road ROW is 25 meters. Mexico Road is a public transportation or MOV corridor, i.e., frequented by intra-metropolitan jeepneys and mega-taxis, metropolitan and some provincial buses.

- **NAIA Road (formerly MIA Road)**

The NAIA Road is a major local road, which links Pasay City to Parañaque City to the west where it eventually joins with R-1. It has an approximate road ROW of 50 meters. The NAIA Road section found in Pasay City is basically a private transportation or LOV corridor, i.e., frequented by private vehicles but also by some intra-metropolitan jeepneys, mega-taxis and metropolitan buses.

- **Domestic Road**

The Domestic Road is a major local road that links Andrews Avenue to the north and NAIA to the south. The approximate road ROW is 25 meters. The F.B. Harrison Avenue section found in Pasay City is basically a public transportation or MOV corridor, i.e., frequented by intra-metropolitan jeepneys and mega-taxis.

- **Aurora Boulevard (Tramo)**

Aurora Boulevard is a major local road, which links C-4 (EDSA) to the north and Andrews Avenue to the south. The approximate road right-of-way (ROW) is about 30 meters; Aurora Blvd. is a public transportation or MOV corridor, i.e., frequented by intra-metropolitan jeepneys and some metropolitan and provincial buses.

Existing transportation

In Pasay City, the primary mode of land transportation is jeepneys and metro buses. Jeepneys routes run along F.B. Harrison, Arnaiz Avenue, Taft Avenue and EDSA.

Jeepneys along F. B. Harrison have the following routes:

1. Baclaran – Libertad – Mabini - Harrison;

2. Blumentritt - Sta. Cruz – Baclaran;
3. Dapitan -Quiapo – Baclaran;
4. Baclaran – Divisoria – Mabini – Jones – Lawton;
5. Sta. Cruz – Avenida – Luneta - T.M. Kalaw – MCU;
6. (6)) Baclaran – Pier; and
7. OWWA-DFA-Harrison.

Jeepneys along Arnaiz Avenue have the following routes:

1. Libertad – Protacio - Cabrera;
2. Evangelista - Libertad;
3. Dominga – Libertad – Ignacio - PBA;
4. H. Plaza – DFA - Astrodome;
5. M. dela Cruz – Libertad - DFA;
6. Libertad – Dian (jeepneys wait near P. Zamora);
7. Cabrera - C. Joda - Libertad;
8. Cabrera Hi-way - Libertad;
9. Libertad -Washington;
10. Pasay – Rotonda - Libertad;
11. M. Reyes – Libertad;
12. EDSA – LRT – DFA - Libertad;
13. Evangelista – Pio – Hiway - Libertad;
14. Blumentrit - Libertad;
15. Taft – Herran – PGH – Dakota – Harrison - Libertad; and
16. Pier – Mabini – Libertad.

Jeepneys along Taft Avenue coming from the City of Manila (With short distance routes use portion of EDSA)

(1) Malibay – Libertad jeeps;
(2) M. Dela Cruz – Libertad jeeps;
(3) Cabrera – Libertad;
(4) M. Reyes – Libertad jeep.
One longer route jeep (the Alabang – Pasay jeep) uses portion EDSA and terminates its route near Taft – EDSA intersection.

(1) Malibay – Libertad;
(2) M. Dela Cruz – Libertad; and
(3) Cabrera – Libertad; and
(4) M. Reyes - Libertad.

The following Table (**Table 2.4.29**) describes the existing jeepney routes within Pasay City.

Table 2.4.29 Existing Jeepney Routes

ROUTE: TRAVERSED STREETS	TERMINAL/WAITING AREA
1. **MALIBAY – LIBERTAD** C. Jose – left C. De Guzman – left at P. Santos - left at Apelo Cruz – right at C. Jose – right at EDSA – U-Turn at SLEX flyover – left along EDSA southbound – right F.B. Harrison – right Libertad – right Park Ave. – right at EDSA and U turn for EDSA northbound – finally right to C. Jose	CLEMENTE JOSE Corner De Guzman
2. **LIBERTAD – M. REYES** M. Reyes cor EDSA- right EDSA – right Taft Ave. – left Pasay Lions Rd. – right P. Villanueva – left Galvez Ave. – right F.B. Harrison – right Libertad – Cementina – (MAKATI) right to Batangas – left Balderrama – right Bavanggueno – left to Jerry St.– right Capt. M. Reyes – back to terminal.	M. REYES COR. EDSA

ROUTE: TRAVERSED STREETS	TERMINAL/WAITING AREA
3. **LIBERTAD – CABRERA** Colayco – left Libertad – right Tramo –right Protacio St.- right to Tolentino St.- straight to Cabrera St. –right to EDSA – right to P. Zamora – left to Tramo cr. Protacio – straight Tramo – left Libertad – right P. Burgos – left Villareal -then back to terminal.	COLAYCO ST.
4. **LIBERTAD - M. DELA CRUZ** M. dela Cruz – left to Libertad-Cementina Dolores St –right P. Burgos St – left to Villarealst. – right Colayco – left Libertad-Cementina Dolores St. – right Tolentino Esguerra – right Tolentino – left Protacio – left M. dela Cruz - back to terminal.	M. DELA CRUZ ST.
5. **EVANGELISTA-LIBERTAD** Evangelista left to Arnaiz St.-right to P. Burgos-left to Sen. Gil Puyat St. – left to Harrison St.- left to Arnaiz St going back to Evangelista	EVANGELISTA ST. COR. EDSA
6. **NICHOLS-V. CRUZ-EDSA-TRAMO** **ALTERNATE ROUTE: NICHOLS- CAA-AIRPORT** Nichols – Andrews Ave. – Airport Rd. – right Roxas Blvd. – right P. Lovina Sr. – right to Park Ave. – left Mexico Ave. – straight to Taft Ave. U-Turn along Taft Ave. – left EDSA – right Aurora Blvd. (Tramo) – right Andrews Ave. – left Domestic Rd. – left Mia Rd., right still along Mia Rd. – right Domestic Rd. – right Andrews Ave. – left Aurora Blvd. (Tramo) then EDSA.	GATE 1 NICHOLS (ANDREWS AVE.)
7. **PINAGBARILAN-LIBERTAD** Aurora- left to Don Carlos Revilla- right to EDSA – u-turn under SLEX flyover-EDSA southbound – right to P. Zamora – straight to P. Burgos - left to Villareal – left to Colayco – right to Libertad - left Park Ave. – right EDSA – u-turn to EDSA northbound - right Don Carlos Revilla- back to terminal	AURORA BLVD. COR. PINAGBARILAN
ROUTE: TRAVERSED STREETS	**TERMINAL/WAITING AREA**
8. **VILLAMOR G1 – G2** G2 right to Manlunas – right 4th st. – left 17th st. – Airmen's Vill. – left 14th st. – left 12th st. – right 10th st. – left Manlunas From Manlunas Jeep Terminal – right 3rd st. – right 4th st. – left to Andrews Ave. – right to Sales then South Super Highway.	GATE 2
9. **DOMINGA – LIBERTAD** Dominga – left G. Puyat Ave. – right Edison – right Morse st. – left Marconi – right Cementina up to Libertad – left F.B. Harrison – right Ignacio – left Park Ave. – right P. Reyes then Pasay Lions Rd. – left Taft Ave. – right to Arnaiz St. (Cementina) – left Marconi – right Morse – left Edison – left Gil Puyat Ave. – right Dominga.	DOMINGA
10. **LIBERTAD-WASHINGTON** -Left Batangas–right Finlandia straight ahead to Dela Rosa–right Washington then Makati Sq. up to Mckinley–right Fernando –right Antonio Arnaiz (Libertad-Cementina)–left Primero de Marzo then D.C. Laurel–left T. Inocencio–J.P. Rizal– right to Cementina-Dolores (Libertad)	P. ZAMORA COR LIBERTAD
11. **ALABANG – PASAY** G2– South Super Highway – left EDSA – U-Turn end of EDSA then right South Super Highway (West Service Rd.) straight ahead up to Alabang.	ALABANG
12. **EVANGELISTA – TRAMO** Evangelista left to Arnaiz St.- right to P. Burgos - cross Sen. Gil Puyat St. – to Dominga up to Gutierrez – turn around back to Gil Puyat – turn left at Gil Puyat – right at tramo – left at arnaiz up to evangelista	EVANGELISTA COR. EDSA
***DIAN-LIBERTAD** From Makati going west along Arnaiz Ave. (Libertad) right at P. Burgos, left at G. Puyat Ave., left at F.B. Harrison St., right at Arnaiz Ave. (Libertad), cross Taft Ave., continue along Arnaiz Ave. (Libertad) until it reaches Makati	BETWEEN TRAMO AND AURORA STREETS

Metropolitan commuter systems within its boundaries namely:

The Light Rail Transit (LRT) and the Metro Rail Transit (MRT) are the two of the three existing light rail systems that traverse portions of Pasay City. The LRT runs on elevated railway along Taft Avenue. While the MRT dashes along EDSA to its Southern Terminal at the intersection of Taft Ave. and EDSA.

Light Rail Transit (LRT) Line 1 system operates on top of R-1 (Taft Avenue) with stations at C-3 (Sen. Gil Puyat Avenue), Arnaiz Avenue, C-4 (EDSA), and the south terminal at Mexico Road. The LRT Line 1 has its depot along Andrews Avenue. The LRT Line 1 offers a north-south linkage through the cities of Manila and Caloocan;

Mass Rapid Transit (MRT) system which operates on C-4 (EDSA) with its west terminal near R-1 (Taft Avenue); the MRT offers a north-east-south linkage through the cities of Makati, Mandaluyong and Quezon; and

Philippine National Railways (PNR) commuter rail system which operates alongside R-3 (SLEX) and offers a north-south linkage through the cities of Manila, Caloocan, Parañaque; Las Pinas and Muntinlupa.

BUS TERMINALS

There are at least 15 terminals for provincial buses located in Pasay City. Most of these bus lines service southern destinations in Region IV and Region V, The entry of provincial buses is one of the major causes of traffic in the city.

BUS ROUTES

The routes used by buses are Sen. Gil Puyat Avenue (formerly Buendia) EDSA (C-4), Roxas Blvd., NAIA Road, Domestic Road, Aurora Avenue, and Taft Avenue (between Vito Cruz and Buendia).

AIRPORT TERMINALS

The Ninoy Aquino International Airport is located within Pasay City and Parañaque City. This serves as the primary international gateway to foreign destinations and the main port of entry for those coming into the Philippines. The runway length is 2,720 meters and the width is 46 meters. The Manila Domestic Airport is also located within Pasay City and serves destinations within the country.

FERRY TEMINAL

Pasay City also has the distinction of hosting the only extra-metropolitan ferry terminal within its boundaries, i.e., beside the Tanghalang Francisco Balagtas (formerly the Folk Arts Theater). Ferries bound for points in Bataan or even Corregidor and back to Metro Manila call on this terminal.

Existing traffic situation in Pasay

Based from the 2011 CLUP of Pasay City, traffic congestion is mostly situated at the adjacent city of Manila on the north side, Makati City on the eastside and Paranaque City on the south side. These major roads are traversing Pasay City that cause vehicular congestion.

It can be noted that routes used by buses are Sen. Gil Puyat Avenue (formerly Buendia). EDSA (C-4), Roxas Blvd., NAIA Road, Domestic Road, Aurora Avenue, and Taft Avenue (between Vito Cruz and Buendia) while the jeepneys are passing by Taft Avenue, F.B. Harrison St., Buendia Avenue, (between Harrison and Pasay-Makati boundary), EDSA, Andrews Avenue, Domestic, NAIA Road, Ninoy Aquino Avenue, and the West Service Road of the South Luzon Expressway (SLEX).

According to the Pasay City CLUP, previous studies conducted along Boulevard 2000 and from data provided by the Department of Public Works and Highways (DPWH**), the estimated vehicle volumes along the R-1 section in Pasay City in 1995 reached 100,000 vehicles per day.** This is the section of Roxas Boulevard extending from President Quirino Avenue (C-2) in Manila to the EDSA (C-4) junction. **The traffic volume on stretches of C-4 (EDSA) from R-3 (SLEX) towards R-1 (Roxas Boulevard) ranges from 75,000 to 140,000 vehicles per day.**

The following are the major metropolitan traffic bottlenecks within the boundaries of Pasay City:

- The intersections of R-1 (Roxas Boulevard) with C-4 (EDSA) and C-3 (Sen. Gil Puyat Avenue) and sections of said roads leading to the intersections;
- The intersections of F.B. Harrison Avenue with C-4 and C-3 and sections of said roads leading to the intersections;
- The entire section of F.B. Harrison Avenue in Pasay City;
- The intersections of R-2 (Taft Avenue) with C-4 and C-3 and sections of said roads leading to the intersections;
- The entire Mexico Road (Taft Avenue Extension);
- The intersections of Andrews Avenue with Aurora Boulevard (Tramo) and Domestic Road and sections of said roads leading to the intersections;
- The entire Domestic Road;
- Portions of NAIA Road between Domestic Road and Ninoy Aquino Avenue;
- The intersections of Arnaiz Avenue (Libertad) with F.B. Harrison and R-2 and sections of said roads leading to the intersections;
- The entire stretch of Cuneta Avenue; and
- The R-3 (SLEX) exit area at Villamor Airbase.

Existing Traffic Situation near the Project site

The proposed project is situated near the Philippine Sofitel Hotel. The two nearest major metropolitan traffic bottleneck near the project site are Roxas Boulevard extending from President Quirino Avenue and Sen. Gil Puyat Avenue.

Roxas Boulevard is an eight-lane major arterial road that connects the center of Manila to Pasay City, Paranaque City and Cavite. In fact, the south bound end of Roxas Boulevard starts the Manila-Cavite Expressway known as Coastal Road or Cavitex.

According to Manila District Traffic Enforcement Unit **(MDTEU)** most of the employees or the road users coming in and out of Roxas Boulevard are residing in Cavite resulting to a heavy traffic volumeparticularly area near the intersection of Quirino Avenue corner Roxas Boulevard from 7am to 11am. Moreover, heavy traffic volume from 5pm to 8pm on the south bound area of Roxas Boulevard.



Figure 2.4.6 Road Map Showing the Project Site

Roads and Traffic in the Boulevard 2000 Project

The major roads that will serve the internal accessibility within the Boulevard 2000 area are the extension of circumferential roads, Seaside Drive Extension (also referred to a MIA Road) and two major arteries parallel to R-1. These two arteries are referred to as Central Boulevard and Bay Boulevard. These roads are likewise expected to ease out the traffic along Roxas Boulevard in the future.

The Central Boulevard is planned to run from C3 to C5 with a right of way of 46 meters, initially with three vehicle lanes in each direction. It will also have additional lanes for internal shuttle system which will serve as the primary public transport within Boulevard 2000.

The Bay Boulevard in the same manner will run from C2 to C5 with a right of way of 50 meters, with four vehicle lanes in each direction. The opposing traffic will be divided by a median island. Although not strictly a limited access road, the left turning movement will be restricted only to the major secondary laterals.

The Seaside Boulevard will be exclusive only to CBP1, which is a 35 meter road straddling the 50 meter wide strip along the coast. The 50 meter strip will be the host for pedestrian promenade, pocket parks, parking slots and bicycle lane.

The traffic within the Boulevard 2000 is expected to increase rapidly in its development stage until it becomes heavy particularly around the commercial and business establishments. To avoid chaotic traffic scenarios, traffic management measures should be in place. Vehicular flow will be at grade and traffic signals controlled and connected to Traffic Engineering Center with the assistance of onsite traffic personnel for further assistance.

In addressing the needs for public transportation within Boulevard 2000, an internal transport system will be linked with existing external routes. This system will call for transfer stations outside or inside of the Boulevard 2000 where passengers can change vehicles which will bring them to their places of destination inside.

Compatibility with the Department of Public Works and Highways plan for a Manila Bay circumferential road system and its neighbors, namely the cities of Manila and Paranaque

Based on recent experience with other Reclamation Projects in Manila Bay, the DPWH is indeed consulted among others. PRA requires that DPWH and others issue a Letter of No-Objection prior to its awarding a Notice-to-Proceed to the Proponent. Such letters are also required from other entities.

A requirement of the DPWH prior to issuing certification and discussing the merits of the Project is an ECC. Nevertheless conceptual plans are made and hereunder indicated **On the Circumferential Road System.**



Figure 2.4.7 Map showing the future C6 road

Table 2.4.30 Annual Average Daily Traffic (AADT) in selected roads, 2011

Road Name	Direction	Road Section ID	MC, Tricycle	Passenger Car	Passenger Utility	Goods Utility	Small Bus	Large Bus	Rigid Truck 2 Axles	Rigid Truck 3+ Axles	Truck Semi-Trailer 3&4 Axles	Truck Semi-Trailer 5+ Axles	Truck Trailers 4 Axles	Truck Trailers 5+ Axles	TOTAL
SLEX	SB	S02928LZ	5,650	16,148	10,264	5,534	56	676	1,701	1,569	1,776	904			44,278
SLEX West Service Rd	SB	S03330LZ	5,305	15,796	3,936	1,952	159	156	620	406	297	273	40	26	28,966
Roxas Blvd	SB	S03228LZ	6,161	18,215	1,924	2,521	188	3,337	1,265	680	614	257	345	208	35,715
Roxas Blvd	NB	S03335LZ	2,838	8,797	6,821	2,188	857	4,121	809	672	471	257	238	210	28,279
Roxas Blvd East Service Rd	NB	S03251LZ	1,493	4,262	341	565	8	40	350	111	49	2	4	1	7,226
Roxas Blvd East Service Rd	SB	S03341LZ	1,506	3,549	4,270	1,010	89	123	235	10	-	-			10,792
Taft Ave	NB	S02947LZ	1,757	3,221	5,052	410	249	794	253	157	328	47	94	20	12,382
Taft Ave	SB	S03475LZ	2,446	1,580	4,455	264	2	60	42	2	-	-			8,851
Antonio Arnaiz Ave	EB	S03427LZ	-	4,527	3,801	3,781	241	-	684	-	-	-			13,034
Aurora Blvd	NB	S03337LZ	2,923	4,904	2,246	707	17	43	358	58	24	53			11,333
Aurora Blvd	SB	S03355LZ	5,648	15,840	5,777	1,958	116	203	721	252	28	57	5		30,605
Balagbag Rd	-	S03343LZ	4	5,308	14	5,447	213	282	422	43	-	-			11,733
FB Harrison	SB	S03323LZ	2,600	8,786	10,796	5,645	29	14	2,222	65	-	-			30,157
FB Harrison	NB	S02747LZ	2,600	8,786	10,796	5,645	29	14	2,222	65	-	-			30,157
Gil Puyat Ave	EB	S03325LZ	2,728	16,948	6,600	1,048	36	3,179	405	176	239	63			31422
Gil Puyat Ave	WB	S03326LZ	4,562	15,070	6,571	590	129	3,559	499	488	540	189		1	32198
Tramo Rd	-	S03333LZ	1,171	726	315	706	-	-	126	4	-	-			3,048
Airport Rd	-	S03275LZ	52	11,103	4,697	5,668	91	74	473	69	21	24	23		22,295
Andrew Ave	WB	S03392LZ	1,893	22,028	5,077	22,677	162	341	3,315	1,001	406	775		9	57,684
Andrew Ave	EB	S03391LZ	1,893	22,028	5,077	22,677	162	341	3,315	1,001	406	775		9	57,684
Domestic Rd	EB	S03324LZ	590	44,116	2,280	28,287	170	163	2,152	383	66	256			78,463
Electrical Rd	-	S03329LZ	766	9,873	2,995	5,713	55	77	591	202	13	33			20,318
Manila South Gate Rd (NAIA Rd)	SB	S03320LZ	5,397	49,196	5,112	3,057	207	1,120	799	360	194	203	71	25	65,741
Manila South Gate Rd (NAIA Rd)	NB	S03321LZ	183	26,683	11,085	16,752	234	2,123	1,897	574	202	204			59,937
Ninoy Aquino Ave	NB	S03431LZ	6,687	36,140	5,428	3,529	240	745	863	537	165	135	22	3	54,494
Ninoy Aquino Ave	SB	S03428LZ	6,065	29,088	4,677	4,066	42	151	819	612	233	135	5	6	45,899
Sales St.	EB	S02944LZ	726	47,243	2,303	38,650	127	258	4,043	564	67	148			94,129
FAT Access Rd	-	S03276LZ	11	1,953	661	1,254	6	5	8	1	-	-			3,899
PICC Fat Perimeter Rd	-	S03236LZ	6	5,722	334	3,354	9	52	27	2	-	-			9,506
Spine Rd	-	S03211LZ	12	16,449	286	17,504	18	128	101	9	1	-			34,508

Source: DPWH

Mitigating measures on Traffic

Further the continuing initiatives of the MMDA and the on-going construction of infrastructures solitary built for traffic decongestion of the government will benefit this project such as:

- The recent (January 2014) announcement of the use by the MMDA of modern CCTV in monitoring traffic as well as the strengthening of the "Non-Contact" apprehension plan will greatly help.

- Additional expressway project being constructed and intended to alleviate existing and future traffic problems going to and from the MIA/NAIA Complex. (See **Plate 2.4.1**)

It may be expected that when DPWH and MMDA firms up the details of their plans coordination with all of the Reclamation Project Developers will be made especially the neighboring cities of Pasay particularly the Cities of Manila and Paranaque.

On-going and Planned Infrastructures for Traffic Decongestion

Expressway project intended to alleviate existing and future traffic problems. A photograph of the ongoing construction is shown in **Plate 2.4.1.**





Plate 2.4.1 Ongoing Construction of Elevated Roadways

Though the proposed project is only intended for land reclamation, there will still be an increase of vehicular movements within the site.

Thus the Project proponent which is the City of Pasay will be in closely coordination with neighboring cities and the MMDA to be able to fully implement effectively traffic management measures and thus address traffic congestion.

Provided **in Figure 2.4.8** is the map showing the future C6 road which will ease the volume of traffic in the area.

In addition, during the Operations Phase there will be impact of the project on the traffic situation within the City of Pasay and neighbors.

Proposed Transport Strategies

For the proposed project, variety of modes for reclamation project is considered such as (a) simple bus system using dedicated lanes (b) Construction of a tram line in the city core connecting to the MRT/LRT system in Manila (c) Implementation of the BRT system along the main road (d) Construction of a second tram line covering the islands. (d) Evolution of the BRT towards an elevated or underground dedicated system (most probably rail) along the main road.

Future Transportation Projects

Pasay City will be a key component in the projected future development of the road network of Metropolitan Manila. The notable road developments proposed, ongoing or partially completed for the areas within Pasay City's boundaries are the following:

- The completion of the Central Boulevard in the Central Business Park Island A [CBP-1(A)] portion of the Boulevard 2000 Project; this road shall be the major radial road for the Boulevard 2000 Project and is expected to be very busy particularly around intersections with C-3, C-4 and the NAIA Road;

- The construction of the Bay Boulevard in the CBP-1(A) and the Financial Center Area (FCA) portions of the Boulevard 2000 Project; this road shall be the other major radial road for the Boulevard 2000 Project; and

- The construction of the Seaside Boulevard in the CBP-I(A) portion of the Boulevard 2000 Project; this road shall be the secondary but coastal radial road, i.e., an esplanade, for the Boulevard 2000 Project.

- The timing of the following rail-based mass transit systems will definitely influence the pacing of the proposed developments within the westernmost parts of Pasay City, particularly along the reclaimed areas:

- The LRT Line 1 Capacity Expansion Project;

- The proposed LRT Line 1 Extension Project (Pasay City to Imus, Cavite) along Quirino Avenue and Aguinaldo Highway;

- The proposed LRT Line 6 that will service the Boulevard 2000 Project area, i.e., linking Pasay City with Cavite Province along Bay Boulevard;

- The proposed people mover system within the Boulevard 2000 Project area; and

- The upgrading of the PNR commuter rail services.



Figure 2.4.8 Proposed Transport Strategies

As a matter of protocol and as experienced with other reclamation projects in Manila, after the ECC shall have been secured, the Proponent cannot implement the Project without a "Notice to Proceed" (NTP) from the PRA.

This NTP is on the other hand, contingent on the Proponent being able to secure Letters of No – Objection from concerned agencies which have the mandate on key matters e.g.

- The DPWH On Floods and Infrastructures to alleviate Traffic
- The MMDA
- Others

The agencies, however, will only process the application for Letters of No Objection upon submission by the Proponent of the ECC as well as of the full EIS Report.

Thus while general guidelines are presented in the EIS on traffic the more in depth impact assessment and mitigating measures will be undertaken with the DPWH which will be a party to traffic management as well as to flood control.

Traffic Congestion On Waterways

There are no natural freshwater systems within the proposed reclamation site. Freshwater, mixed with domestic wastewaters, emanate from the Libertad Channel and Maynilad-Pagcor pumping stations but these are not suitable bodies of water for the existence of significant fish stocks or sizeable invertebrate communities. Freshwater discharges from these channels, as well as from other floodgates and waterways spilling from the Pasig River further to the south, are also not ecologically conducive for aquaculture or recreational uses. The outflow of water from these channels will not be affected by the proposed reclamation project as canals that are engineered to ensure fluid and stable outflow of the discharged waters will be built.

The 300 hectare-component of the Project could likely present inconvenience but not restrictions to access to fishing grounds for the fisher folks.

2.4.8 Impact on the commercial establishment along Roxas Blvd within the Barangay directly adjacent to the project site

Impacts

It is not feasible to make a general statement on whether the project will positively or adversely impact on commercial establishments already existing adjacent to the project site.

Since there will be significant increase of customers for food, apparel, merchandise, grocery items, services, etc. the existing establishments can potentially benefit from this increase. On the other hand, there will rise more competition and since the markets are on the reclamation area those current on shore will have disadvantage unless they relocate their businesses on the reclamation area. The operating expenses may, however, be greater.

2.4.9 FGD Public Consultations/Discussions, KII and Perception Surveys

2.4.9 1 PASAY CITY

2.4.9.1.1 PERCEPTIONS AND ATTITUDE TOWARDS THE PROJECT

Issues and concerns raised during the conduct of Public Scoping		
Issues/Suggestions Raised by Stakeholder	**Sector or Representative Who Raised the Issue/ Suggestion**	**Proponent's Response**
• Are there any vertical development	Edwardson Ong- Legal of Sofitel	Mix Development. No particular development 30% will be roads and open spaces.
• How wide the reclaimed area from the seawall	CCP representative	500 meters wide
• Land subsidence	Atty. Felix Sayago -CCP representative	There would be such impact of land subsidence as a result of Pasay Project
• Waste control system	George Misa -CCP representative	Our end is to find a common solution
• Main road going to reclamation	Edwarson Ong Sofitel Representative	As of the moment no concrete plans (PRA)
• Liquefaction, subsidence		There are certainly engineering interventions for seismicity.
• 50 meter canal GSIS area canal (from Toyota to Libertad channel)	Danilo Martinez GSIS representative	50 meter canal is a requirement by the PRA.
• Impact of reclamation on water degradation	Danilo Martinez GSIS representative	50 meter canal is a requirement by the PRA.
• Proof that reclamation is a solution to flooding • Buffer storm surge (sea level rise)	Robert Jara- PEMSEA representative Teresa Salanguit–Coastal Manila Bay Coordinating ArmidaCerdenas- President of Geronimo Homeowners	Our obligation to this application is to complied with Manila Bay coastal strategy Engineering designs come into place There will be no cutting of mangroves. Enhancement aspect for the project. There are no **significant** fish species.
• Environmental, Cultural and Historical impact / aspect	Atty. Felix Sayago -CCP representative	Environmental- there is an ECC application for environmental compliance

Issues and concerns raised during the conduct of Public Scoping		
Issues/Suggestions Raised by Stakeholder	**Sector or Representative Who Raised the Issue/ Suggestion**	**Proponent's Response**
• Is reclamation the only way that City of Pasay Progress	Antonio Arevalo- Office of the VP representative Danilo Martinez GSIS representative	There is a height requirement
• Conserve and preserve the national heritage	Robert Jara- PEMSEA representative	We say that this application, our obligation is to complied with Manila Bay coastal strategy Engineering designs come into place
• Basis for the designs		
• Status, Process and timetable of project	Edwardson Ong- Legal of Sofitel	ECC alone maybe 3-4 months. ECC is not a permit. It is a planning tool. It is now on the City of Pasay on the timetable. Pasay, 4 years period. Horizontal dev. After 4 years is the development
• Comparison of Pasay and Manila Project		This project is different and independent. It will go to a process
• Vision on what type of commercial establishment and investor	Cesar of Phil. Tourism Authority	As of the moment, no exact how many or type of establishments. The project is a horizontal development.
Concerns for traffic.	**Godson Escopete- Defend Manila Bay**	We are still in the initial stage of public scoping. The EIS System includes two (2) aspects. 1. What are the problems and what are the solutions. 2. What are the effects/impacts and what are the mitigating measures We will show this in this two aspect in our EIS Report, EMB will say if the EIA report is acceptable or not based on the appreciation of the report by the EMB and the Review Committee/resource persons
Bird Sanctuary	**Marley Mendoza (Pawb)**	
Blockage of Libertad Channel	**Councilor Bong Tolentino of Pasay**	
Libertad Channel Over flow	**Godson Escopete – Defend Manila Bay**	

Issues and concerns raised during the conduct of Public Scoping		
Issues/Suggestions Raised by Stakeholder	**Sector or Representative Who Raised the Issue/ Suggestion**	**Proponent's Response**
Displacement of People	**Sister Bernadeth Casa-Assumption Malibay Pasay**	

2.4.9.1.2 PERCEPTION SURVEY RESULT WITHIN PASAY

Number of Respondents = 3

Occupation:	**Result:**
Wala	
Gov't / Private employee	
Business (store, carinderia, etc.)	33.33%
Laborer / construction worker	
Driver (tricycle, jeep, taxi etc.)	
Brgy. Official	
Others, specify (sidewalk vendor, mangingisda)	33.33%
No Answer	33.33%

Pinakamataas na pinag-aralan	**Result:**
Wala	
Elem. Level / Grad	
HS level / Grad	66.67%
College level / Grad	33.33%
Vocational	
Others, specify	
No Answer	

Sex	**Result:**
Male	66.67%
Female	33.33%

Martial Status	**Result:**
Single	66.67%
Married	
Widowed	
Live-in	33.33%
Others, specify	
No Answer	

Religion	**Result:**
Wala	
Catholic	100%
Islam	
Born again	
Baptist	
Others	
No Answer	

Ilan ang miyembro ng pamilya	Result:
1-3	100%
4-6	
7-9	
10-12	
Others, specify	
No Answer	

Ilan ang nag-tatrabaho sa pamilya	Result:
1-3	66.67%
4-6	33.33%
7-9	
10-12	
Others, specify	
No Answer	

Tirahan	Result:
Sarili o pag-aari	66.67%
Nangungupahan	
Nakikitira sa kamag-anak	
Dormitoryo	
Others (Along Roxas Blvd.)	
No Answer	33.33%

Alam ba ninyo na may planong magkaroon ng Reclamation project sa Likod ng Sofitel Manila?	Result:
Oo	66.67%
Hindi	33.33%
No Answer	

Saan niyo nakuha ang kaalaman tungkol sa pinaplanong proyektong ito?	Result:
Mga opisyalng barangay / bayan	
Mga kinatawan ng proyekto –PRA / Pasay.	
Pagdalo sa pulong tungkol sa proyekto	33.33%
Mga kapitbahay, kamag-anak, tsimis, radio, TV News	
Iba pa.	33.33%
No Answer	33.33%

Saan pang-kalahatan, makakabuti po ba ang binabalak na proyektong Reclamation Project? Bakit?	Result:
Oo	33.33%
Hindi	33.33%
No Answer	33.33%

Sa inyong palagay, ano po ba ang mabuting epekto	Result:
Trabaho	33.33%
Pangkabuhayan	
Turismo	33.33%
Wala	

Sa inyong palagay, ano po ba ang mabuting epekto	Result:
No Answer	33.33%

Sa inyong palagay, ano po ba ang masamang epekto?	Result:
Kapaligiran	*66.67% Pollution Gugulo ang Kapaligiran*
Iba pa	
No Answer	*33.33%*

Ano po ang inyong mga mungkahi tungkol sa proyekto na dapat isaalang-alang ng kumpanya o gobyerno?
Opportunity for small business, e.g. sari-sari store

Ano pa po ba ang iyong suhestyon para sa ikakabuting proyektong ito?
Proper study and consultation must be conducted to predict projects future effects to environment
Proper discipline

Plate 2.4.2 Perception survey photos along Pasay





2.4.9.1.3 Interview with Fisher Folks at Libertad Channel, Pasay City

The fisher folks who anchor their boats at the Libertad Channel (shown in the map of the Impact Areas) are considered among the vulnerable people because they rely on small scale fishing for their daily meals/sustenance and from which the extra catches are sold as additional source of livelihood.

The concerns are confined to

(a) Fears of being asked to relocate

(b) Concern for loss of easy access to the fishing grounds in view of the location of the northern boundary of the 300-hectare reclamation directly at the mouth of the Libertad Channel

It was gathered that these fisher folks are not residents of Pasay but of Cavite and that apparently they do not possess the necessary permits/clearances for fishing.

A photograph of the interview with Mang Tayson is shown in **Plate 2.4.3** while the boats anchored along Libertad Channel are shown in **Plate 2.4.4.**

Plate 2.4.3 Interview with Mang Tayson, one of the fisherfolks who anchors along Libertad channel



Mang Tayson, one of the fisher folks in the foreground of the boats parked in Libertad Channel. Mang Tayson claims there are about fifty (50) such boats which catch fish (tilapia, bangus) in occasional seasons at the Manila Bay fronting the proposed reclamation project. Mang Tayson is aware of the proposed reclamation project and has no complaints about it except that the project should not deprive them of their means of livelihood. (Photo taken 15 08 14)

On Remark that Fisher folks prohibited from fishing

This remark refers to fishing at the Paranaque side and there is not considered relevant to this particular project.

Plates 2.4.4 Photo of boats anchored at Libertad Channel



2.4.9.2 SURVEY WITHIN NEIGHBORING / ADJACENT COMMUNITIES

2.4.9.2.1 PARANAQUE

Key informants Interview

On the other hand, another survey was conducted last August 11, 2014 and August 15, 2014 for the Proposed 360 hectares Pasay City Reclamation Project. Key Informant Interview was conducted in Paranaque area in Bulungan Market which is considered as market Place, Seafood Market in La Huerta, Parañaque City.

Key Informants Interview (KII) - Bulungan Market (Paranaque City)

No. of respondents: 8
Name of Organization / Association: **Kasamahang Mandaragat ng Paranaque (KASAMPA)**
Samahang Mandaragat ng Tambo (SAMATA)
Paranaque Fish Vendor Association (PFVA)
Unified Marketing Services Cooperative of Paranaaque Fisherman Work- (Mother Cooperative and has 17 Primaries)
Multi-Purpose Ocean Gold
Police assigned in Bulungan Market

Responses:

"Ito po ba ang Daungan ng mga Isda?"

YES – 8

No - 0

"Ano po ang mga Isda at pang dagat na pagkain na dinadala dito?"

As to the results of the interview, mostly of the species being sold in Bulungan Market are Milk Fish *(Bangus*) from Batangas, Tilapia, Round Scad *(Galunggong)*, Crabs *(Alimasag)*, Shrimp *(Hipon)*, Squid *(Pusit)*, Dilis, Salmon, Yellow Fin, Lapu-Lapu, Sapsap, Salinyase, Tahong, Alamang,*Sapra* (fish pens), and *Talakitok.*

"Saan Nanggaling" / " Mayroon po bang isda na nakukuha sa Manila Bay? Saang parte ng Manila Bay Nanggagaling"

Mostly of the seafood products come from Mindoro, Bicol, Palawan, Sapra (fish pens), Batangas, Dagupan, Cavite, portion of Manila Bay which is Navotas, Malabon and Paranaque.*Alamang* mostly came from the middle of Manila Bay. Frozen fish are from China. Based from the survey conducted, when ask if there are fishes being catch near Mall of Asia (MOA) most of the respondents said there are no fish being catch and sold in Bulungan Market for that particular area.

On the other hand, one respondent –a member of Unified Marketing Services Cooperative of Paranaaque Fisherman Work said there are fishes being catch and sold near MOA but cannot identify the quantity and species of fishes for that particular area.

Moreover, based on the survey, common fishes being caught in Manila Bay are Alimasag, Salinyasi, Bangus, Talakitok, Dilis, Tamban, Pusit etc.,. These species are caught in Navotas, Paranaque, and Cavite portion of Manila Bay. Furthermore, one respondent emphasize that most of the fish from Paranaque portion since most of the boats are registered in Paranaque.

" Mga magkano po ang halaga ng mga pagkaing dagat na dinadala dito sa loob ng isang buwan?"

Peak season for Dilis, pusit etc., occurs during the month of March to April wherein vendors can earn not less than Php10,000 a day. On the other hand, during these months, a boat carrying squids can carry of about 5000 squids a night.

During wet season, most of the fish being sold are "frozen fish" from China. *Alamang* is the dominant species being sold in the market wherein one can earn Php5000-10000 a month.

On the other hand some of the respondents cannot determine the estimated amount of fish product being sold. Prices depend on the availability of the fish product and subject to change depending on weather conditions and product demand.

" Mga pang karaniwang suliranin sa Fish Market"

As to results of the survey, there are no major problems being encountered in the fish market area.

Common problems being encountered by the vendors and fishermen's are flooding due to high tide.

" Mga taga saan ang Nagtitinda dito?"
" Tagasaan ang mga mangingisda?"
"Taga saan ang mga traders?"

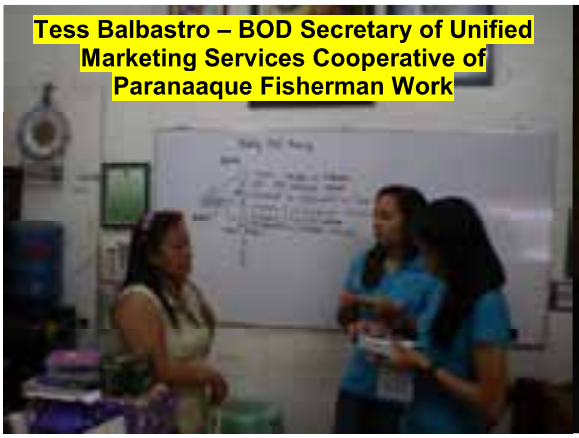
Mostly of the sellers and fishermen's comes from the nearby communities in this area. They are from Cavite, Malabon, Navotas, Paranaque, Las Pinas. As to traders, they are from Malabon, Batangas, Navotas, Bulacan.

"Tungkol sa Reclamation Project anoang Pananaw ninyo?

Manila Reclamation Project
Pasay Reclamation Project
Paranaque Reclamation Project

In Manila Reclamation Project, 90% of which doesn't want to give their comments and 10% approved. In Paranaque reclamation 40% of which opposes the project for they are the one to be affected with. For Pasay 20% agrees and 40% doesn't want to give their comments and the remaining 20% has no answer.

Plate 2.4.5 Photographs of the Key Informant Interview in Bulungan Market in Paranaque

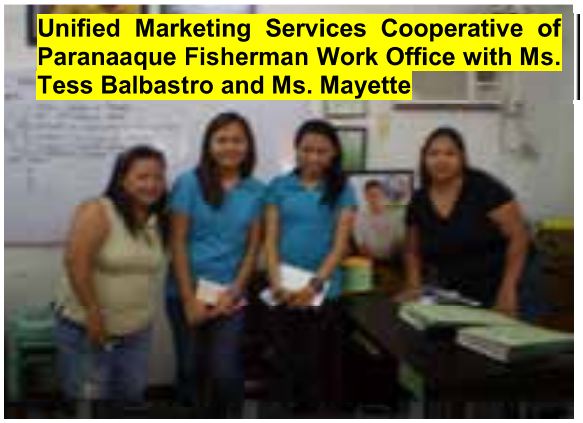

Tess Balbastro – BOD Secretary of Unified Marketing Services Cooperative of Paranaaque Fisherman Work


Mr. Aladin Midtimbang Rajamuda – Police in Bulungan Market


Mr. Joel Crispin – Kasapi ng Multi-Purpose Ocean Gold


KII Interview with KASAMPA fish vendor


Mr. Gary Delgado- SAMAKA Vice Chair


Unified Marketing Services Cooperative of Paranaaque Fisherman Work Office with Ms. Tess Balbastro and Ms. Mayette

2.4.9.2.2 MANILA

PERCEPTION SURVEY RESULT WITHIN MANILA

Number of Respondents = 10

Occupation:	Result:
Wala	10%
Gov't / Private employee	
Business (store, carinderia, etc.)	30%
Laborer / construction worker	
Driver (tricycle, jeep, taxi etc.)	
Brgy. Official	
Others, specify (sidewalk vendor, mangingisda)	60%
No Answer	

Pinakamataasnapinag-aralan	Result:
Wala	10%
Elem. Level / Grad	30%
HS level / Grad	20%
College level / Grad	
Vocational	
Others, specify	
No Answer	40%

Sex	Result:
Male	80%
Female	20%

Martial Status	Result:
Single	20%
Married	40%
Widowed	
Live-in	

Others, specify	
No Answer	40%

Religion	Result:
Wala	
Catholic	70%
Islam	
Born again	
Baptist	
Others	
No Answer	30%

Ilan ang miyembro ng pamilya	Result:
1-3	40%
4-6	20%
7-9	10%
10-12	
Others, specify	
No Answer	30%

Ilan ang nag-tatrabaho sa pamilya	Result:
1-3	40%
4-6	10%
7-9	
10-12	
Others, specify	10%
No Answer	40%

Tirahan	Result:
Sarili o pag-aari	
Nangungupahan	20%
Nakikitirasakamag-anak	
Dormitoryo	
Others (Along Roxas Blvd.)	60%
No Answer	20%

Alam ba ninyo na may planong magkaroon ng Reclamation project sa Likod ng Sofitel Manila?	Result:
Oo	70%
Hindi	30%
No Answer	

Saan niyo nakuha ang kaalaman tungkol sa pinaplanong proyektong ito?	Result:
Mga opisyalng barangay / bayan	40%
Mga kinatawan ng proyekto –PRA / Pasay.	
Pagdalo sa pulong tungkol sa proyekto	
Mga kapitbahay, kamag-anak, tsimis, radio, TV News	10%
Iba pa.	20%
No Answer	30%

Saanpang-kalahatan, makakabuti po ba ang binabalak na proyektong Reclamation Project? Bakit?	**Result:**
Oo	40%
Hindi	60%
No Answer	

Sa inyong palagay, ano po ba ang mabuting epekto	**Result:**
Trabaho	20%
Pangkabuhayan	20%
Turismo	
Wala	50%
No Answer	10%

Sa inyong palagay, ano po ba ang masamang epekto?	**Result:**
Kapaligiran	Baha
Iba pa	*Maapektuhan ang Kabuhayan ng Vendor*
No Answer	

Ano po ang inyong mga mungkahi tungkol sa proyekto na dapat isaalang-alang ng kumpanya o gobyerno?
Employment benefit for the affected areas
Livelihood
Wag ituloy dahil maapektuhan ang kalikasan
Security (magkakaroon ng inuman, away, snatching dahil sa prostitustyon.
Madami na ang pinagbabawal dahil may nagmamay-ari na yung sarili mong lugar bawal na dahil nan doon na ang mga foreigner
Magkaroon ng maayos na company para sa mga nangangailan ng trabaho
Bigyan atensyon at tulungan ang maapektuhan
Hanapbuhay ng mangingisda
Pag-aralan mabuti
Huwag matuloy ang reclamation dahil maiiba ang ambiance ang lugar

Ano pa po ba ang iyong suhestyon para sa ikakabuting proyektong ito?
Environmental awareness
Bigyan ng hanapbuhay ang mga tao
Sana hindi paalisin
Sana bago itayo ang project isipin muna nila kung may maganda o pangit na epekto baling araw
Trabaho
Sana huwag matuloy dahil malaki epekto sa hanapbuhay sa dagat

Plate 2.4.6 Photographs during surveys along Roxas Boulevard Bay area



Mr. Jaime Yangson, vendor and fisherman who resided along baywalk for 2 years with his family



Ms. Lydia Verzosa, a sidewalk vendor for 4 years, living with her family along the bay.





2.4.10 Impact on Tourism

The Roxas Boulevard area hosts multiple hotels, restaurants and parks. It is frequented by locals and tourists alike for various activities such as dining out, drinking in bars, going to theme parks and sight-seeing. The multiple hotels in the area serve to many visitors due to its vicinity to both the airport and the tourists spots.

Most of the Hotels and establishments that were interviewed supported the project and stated that the addition of this new development, and the cruise ship port that will be coming along with it, will definitely bring-in more tourists and revenues. Only one hotel has expressed reservations and opposition to the project. Hotel Sofitel has stated that the reclamation and development of the project area will negatively affect their business due to their view of the bay being obstructed.

Most of the economic activity in the area caters to tourism and hospitality. Interviews with various restaurant chains have yielded that they are supportive of the project. Individual vendors and the informal economy sector in the area are also supportive of the tourist influx that the project will generate but they have expressed concerns that they were not given a promise to continue operating and have not been approached by the developers and the LGU regarding to their views.

Social Development Plan

A community-based Social Development Plan (SDP) draft will be developed through a series of consultation with various sectors of the project-affected barangays, municipal councils, and the government agencies such as BFAR, DSWD, DOH, NGOs, POs and the Community Relations Group of Manila Bay Commission.

The objectives of the SDP include the following:

- Identify the basic needs and welfare of the community as basis for the framework of social development programs of the project-affected barangay within the site of the proposed project;
- Prepare an indicative sustainable plan based on the Barangay Development Plans and the mandated support of the project;
- Establish a working relation with the project and the various community stakeholders with the goal of improving the quality of life of the project-affected community by enabling them to becoming self-reliant.

The community-based consultation and survey during the development of the SDP also provides an opportunity to:

- Address key issues and concerns by the various stakeholders, including those that were raised during the public consultations and FGD's;
- Identify, design, recommend measures in response to the issues and concerns that were raised;
- Identify lead agency or organization responsible in implementing the measures; and
- Set timelines in implementing these measures consistent with the plans and programs of the lead agencies.

The information collected from the community perception survey and consultation will also form part of the SDP that mainly address the following issues:

- Perceived fears of environmental "destruction" or degradation due to pollution of land, air, water and resources, and health risks;
- Possibility of losing their source of livelihood.
- Traffic management issues

Socio-Economic Benefits to the City of Pasay

Acquisition of a Substantial Developed Land for Development Purposes at Virtually No Cost to the City Government.

Pasay City has only a total land area of 18.5 square kilometers, most of it already built up and developed. The geographical feature that the City is not land-locked and has its own bay front rare and unique opportunities for further land expansion through reclamation are presented to the City.

The project, which will produce some 2,520,000 square meters of additional buildable/developable space, will enable the City of Pasay to further expand its own world class tourism, entertainment, commercial and business district. With the acquisition of sufficient critical mass and synergy the City will be able to better compete with and surpass other business districts existing within Metro Manila.

Translated into floor area, the 2,520,000 square meters of additional buildable land will produce some 15,120,000 square meters of building gross floor area (based on an average floor area ratio of 6), which shall be allocated for office, residential, commercial, and mixed uses. These additional building spaces in turn will bring in about 2,116,800 new employees, workers and residents in Pasay City thereby spurring economic growth through increased business activities. The benefits that shall accrue to the to the City of Pasay will be substantial and these will be in the form of additional income and revenues generated from additional real estate taxes, permits and licenses and business taxes, not to mention the employment opportunities that will be opened up to the residents of Pasay City.

The residents and constituents of Pasay City will directly benefit from the reclamation project resulting from the numerous employment opportunities that shall be opened up and be made available to them. The principal private sector that the City will select to develop and manage the Project shall give priority to qualified residents of the City in filling up the manpower requirements of its consultants and contractors during the construction stage of the project and of its locators and tenants upon operation of the various businesses that shall set-up and locate within the project area.

ISSUES AND CONCERNS AND RESPONSES THERETO VENTILLATED DURING THE PUBLIC HEARING

These are summarized in Table 2.4.31 wherein the responses of the Proponent and in the EIS are indicated.

Table 2.4.31 Issues and Concerns and Responses during the Public Hearing

Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City			
Organization	**Issues and Concerns Raised**	**Proponent's Response**	**Page discussed in the EIS**
Ms. Lou Arsenia the Archdiocese Of Manila	1. Sourcing of filling material from San Nicolas Shoal is legally questionable.	The San Nicholas Shoal Dredging Project is presently applying for an ECC; this will resolve question of legality. Other sources of filing materials are available and will be explored.	Page 1-35
	2. According to BFAR there are significant existing fishes and that these can further increase.	Key points are (a) significant fishes (b) survey points in Manila Bay. Slides 36-38 respond to these; Slide 37 shows survey area within the impact zone. Slide 39 shows Aug 20, 2016 fishing survey at the impact zone. (Note: Significant Fishing done outside the project site) Mayor's Speech… "Will neither negatively impact on fisherfolks or damage marine life. Will put up fisherman's whart"	(See **Annex 15**)
	3. DPWH letter denying grant of MGDC LONO	In Mayor's Opening Remarks he cited that in fact DPWH actually issued a LONO. The project on hand is the Pasay Reclamation which is not related to the MGDC Reclamation Project.	(See **Annex 15**)
	4. Other countries may have reclamation but they have been spending money for maintenance.	Maintenance will be regular part of the EMP and will be funded by the Project Developer.	Page 1-58
	5. Flooding, liquefaction, traffic etc., are	Project has not been implemented yet, "perception"	Page 2-2.3

Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City			
Organization	**Issues and Concerns Raised**	**Proponent's Response**	**Page discussed in the EIS**
	not perception, these are realities	used as a term to connote "impact" which is a basic aspect of an EIS. "Realities" cannot be attached to an activity / Project that does not exist. Response	
	6. Continuing Mandamus on Manila Bay	Not applicable for a project which is not yet implemented. No mandamus or compelling action at this stage of the Project.	Page 2-1.15
	7. Precautionary Principle	Briefly explained during the Public Hearing	Page 2-1.24
	8. Tourism--- People can go to environmental friendly areas not commercial areas as envisioned.	Mayor cited tourism related project aspects: public parks, recreation centers.. etc.	**Annex 14**
Atty. Galad Pe Benito Consultant of Arch. Of Manila	9. The Project is the City of Pasay **only**. The EMB required the proponent for a single EIS. The project is piecemeal approach. Why not programmatic EIS, the impacts will be different compared to piecemeal approach:	**Engr. Espie Sajul:** Yes, Single EIS Only, although options for Programmatic EIS are available. The proposed project applied for is only for reclamation. **EIA Consultant:** In the EIS only one proponent will stand and apply for the proposed project. The proponent is accountable and responsible. **Prof Gerry:** We the REVCOM, know what project EIS classification should be recommended. The existing law in the EIS is *"bulok"* (rotten). What can	No need to explain in the EIS Report

Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City			
Organization	**Issues and Concerns Raised**	**Proponent's Response**	**Page discussed in the EIS**
		we do is follow the existing law although *"may kakulangan ang dating batas."* Hence there are IRR guidelines. (The EIA Consultant explained that they are complying strictly with the Revised Procedural Manual and showed to the Public a copy of this)	
	10. The proposed project in the EIS is mixed use but the project is for reclamation.	Presentation clearly stated project covers only creation of reclaimed land also showed major components; support facilities and Preliminary Master Plan	**Section 1.4**
Mr. Garcia Sy Associated with Save our Shore Movement	11. Traffic congestion; the Project will not solve traffic congestion.	Clarified as follows: EIS calls for impacts and mitigation; traffic is an impact of the project for which mitigation measures are identified. The Project was never intended to be a solution to the traffic problem in Manila; discussed in the presentation.	**Section 2.4.7** Traffic Congestion
	12. The proponent can provide jobs in other area in the Philippines. The stated number of employees to be hired will contribute to traffic congestion.	Reclamation project may bring problem to traffic congestion but there are mitigation measures. It may also be noted that if the 2,100,000 Employees would be located on shore, i.e. in a no reclamation project scenario, traffic congestion may even be worse.	**Section 2.4.7** Traffic Congestion

Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City			
Organization	**Issues and Concerns Raised**	**Proponent's Response**	**Page discussed in the EIS**
		Proponent is not allowed to undertake projects in other areas in the Phl.	
Ms. Lou Arsenia Archdiocese Of Manila	13. Fishermen who fishes along Manila Bay up to Paranaque are said to be prohibited to fish because of reclamation. *"Tinataboy ang mga mangingisda na mangisda dahil sa reclamation"*	Noted. (This refers to another project not the Pasay Reclamation Project).	Page 2-2.116
Ms. Arlene Tengonciang **Save our shores (Geologist)**	14. Risks on • Land Subsidence • Flooding--- Reclamation will result to provide water into the bay to come up into the shore • Storm Surge	Responded already in the Presentation of EIA Consultant Mayor noted that President Obama and other Head of States stayed at the existing Reclaimed Area facilities. Discussed in Presentation. Photo of APEC leaders in Reclamation area shown to show lack of serious concern on natural hazards	Section 2.1.2.4 discusses subsidence Flooding Discussed In **Section 2.2.1.1.1** **Sec 2.1.2.4.5** Storm Surge Page 2-1.55
	15. Issues on Ruby Tower	Main cause of Tower collapse was faulty design and construction. No clear cut evidence of liquefaction; this phenomenon was studied in details after the Alaska and Niigata 1961 experience (few years before the	Page 2.1-49

Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City			
Organization	**Issues and Concerns Raised**	**Proponent's Response**	**Page discussed in the EIS**
		Ruby Tower) disaster Slide 55. Further explanation in **Note 15.**	
	16. Maybe there are other solutions beside reclamation that can improve the water quality of Manila Bay to increase fishes.	Noted. The PEISS requires impacts and mitigation for a particular project. (The project on hand is reclamation and thus impacts and mitigations should refer to this particular and not to other types of project. Water quality impact is a result of the project NOT the objective)	Noted
Archdiocese of Manila	17. Who will spend the proposed project? Clarification raised on who the partner of the City is.	This is a project of the City Government of Pasay. No joint venture agreement with Ayala. The City will not spend for the Project	Noted
Ms. Lou Arsenia Archdiocese Of Manila	18. The church built within the reclamation area is currently experiencing problems and needs rehabilitation because water from the sea is reaching the area.	Noted. When the Project materializes; the City of Pasay will include in their SDPs assistances to the church.	**Section 5** SDP
Mrs. Hailey Saturnino Representative of Parish Church and Resident of Pasay	19. Continuing Mandamus on Manila Bay 20. Presidential Proclamation No 41 of President Magsaysay	Refer to Item 6 above The areas covered by this Proclamation do not conflict with the Project as shown in the Presentation. S	Page 2- 15 & **Annex 4** Page 2-23 & **Annex 1**

Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City			
Organization	**Issues and Concerns Raised**	**Proponent's Response**	**Page discussed in the EIS**
	21. NIPAS Ac	Post PH. Project not within the NIPAS; explained in the EIS Report. Mentioned during the Public Hearing	**Sec 2.1.1.2** Encroachment in Environmentally Critical Areas Page 2-1.17
	22. Flooding in Pasay	Discussed in Presentation	Flooding Discussed In **Section 2.2.1.1.1**
Mr. Narod Eco- Save our Shores	23. The Reclamation Platform will not solve storm surges and instead only divert storm surge flows to other part of the City.	Measures including the platform itself and wave deflectors are intended to mitigate storm surges. The reclamation structure will dissipate the wave energy from the storm surge. With or without a reclamation storm surges may occur Slides 64 – 67.	
Ms. Arlene Tengonciang **Save our shores (Geologist)**	24. Land Subsidence Observed in Metro Manila	Acknowledged but subsidence is due to ground water extraction. There will be none associated with the Project. Slide 59. The image of the land subsidence shows this outside of the site. **See Note 24.**	**Section 2.1.2.4.1** Page 2.1.41
	25. The created land will subside.	Proven dredging technology by experience contractor will be adopted.	Page 2.1-45

Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City			
Organization	**Issues and Concerns Raised**	**Proponent's Response**	**Page discussed in the EIS**
	26. Storm Surges will Only Divert the surge to other parts of the Bay/Shore	Land form created will be stabilized prior to vertical construction. Monitoring for subsidence will be made. Reclamation Projects provide sheltering effects from storm surges and are better engineering solution than placing sand bags atop sea walls (Slide 66) Even if the surge is diverted its wave energy would have been dissipated after striking the reclamation walls.	

SECTION IV. ENVIRONMENTAL RISK ASSESSMENT (ERA)

INTRODUCTION:

The definition of the word "risk" is not clearly delineated because "risk" may have two distinct meanings. It can mean in one context a hazard or a danger of an exposure to an accident, mischance or peril. In another context, risk is interpreted more narrowly to mean the probability or chance of suffering an adverse consequence from a fortuitous event. To illustrate, "flood risk" can refer to the presence of a danger of flooding while a flood hazard to a specific probability such a flood event expressed in quantitative terms such as a "0.10% probability".

Environmental risk refer to actual or potential threats of adverse effects on living organisms (man, plants, animals, fish, etc) and the environment caused by effluents, emissions, wastes, resource depletion, etc., arising out of activities involved in a project. (*Martin et al., 1977)*

Risk assessment is a systematic method of identifying and analyzing the hazards associated with an activity and establishing a level of risk for each hazard. The hazards cannot be completely eliminated, and thus there is a need to define and estimate an accident risk level possible to be presented either in quantitative or qualitative way.

Figure 4.1 is an illustration of the risk assessment process.

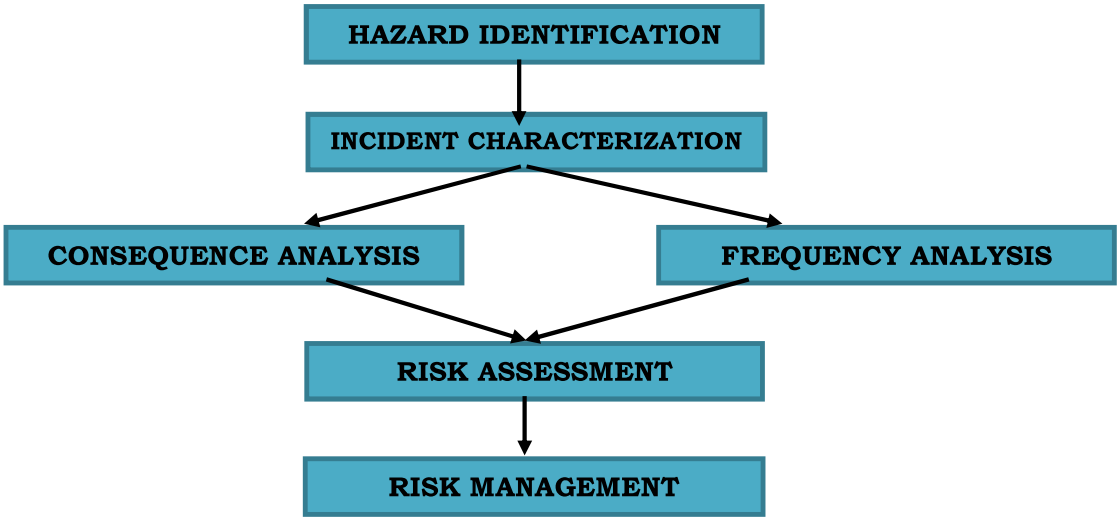


Figure 4.1 An Illustration of the Risk Assessment Process

Hazard identification involves the identification of all possible events or processes that could lead to disastrous or fatal incidents including potential hazards from substances, chemicals and materials (both physical and biological) used in the project process that could result in adverse effects on personnel/people and the environment. As an example for the project, "materials" could include the fills sourced from other sites which will be examined for presence of harmful chemicals such as metals.

Consequence analysis involves the assessment of the adverse or unacceptable **effects** or **results** of an incident or episode from a project activity. When applicable mathematical models may be employed for consequence analysis.

Frequency analysis is the estimation of the likelihood of number of occurrences of the identified hazard and/or the time occurrences of such.

Risk management refers to the overall process of prevention and reduction, of the evaluated hazards, containment of the actual incident/episode, instituting response measures and the monitoring and communicating of the risks to stakeholders and project proponents.

The main objective of this section is to identify and analyze hazards, the event sequences leading to hazards, the risk of hazardous events and the management of the elements of risks.

The discussions below are based on of the Revised Procedural Manual of DAO 03-30 in particular Annex 2-7e. As stated noted in the RPM an ERA, within the context of Philippine EIS System, is concerned primarily with safety risks (characterized by low probability, high consequence, accidental nature and acute effects associated and focused on human safety).

As discussed in previous sections this EIS Report and the ECC application being made is for the reclamation works (Construction Phase of the EIS cycle) and the Operations Phase may be subject to separate requirements of the PEISS. Thus focus is made on the horizontal developments.

4.1 Safety Risks

- Fire
- Explosion
- Release of toxic substances

4.1.1 Identification of conditions, events and circumstances which could be significant in bringing about identified safety risks; *Description & assessment of the possible accident scenarios; Description of the hazards, both immediate (acute effects) and delayed (chronic effects) for man and the environment posed by the release of toxic substance, as applicable*

The above is discussed in the matrix summary in **Table 4.1.**

Table 4.1 Summary Matrix of Safety Risks

Activities	Safety Risks	Probability of Incident	Prevention/Control Measures
Dredging	Fire	Nil to Minimal	Safety procedures at the dredging vessel Diesel Oil used has high Flash Point
	Explosion	Nil	Diesel Oil not explosive
	Release of toxic substances	Nil	No HAPs (Hazardous Air Pollutants) from exhaust of engines
Filling	Fire	Nil to Minimal	Safety procedures at the dredging vessel Diesel Oil used has high Flash Point
	Explosion	Nil	Diesel Oil not explosive
	Release of toxic substances	Nil	No HAPs (Hazardous Air Pollutants) from exhaust of engines
Operation of Heavy Equipment	Fire	From fossil fuels	Safe worthiness of equipment

			Firefighting equipment on board equipment
	Explosion	Not applicable, fuel with high flash point	Not applicable
	Release of toxic substances	Oil sludge generation	Not discharged to bay, instead to onshore

Based from the above table, there is no significant safety risks involved in the proposed project. The activities involved are confined to the reclamation area and away from population centers; thus there are no societal risks associated.

4.1.2 Assessment of whether the project location is projected to have extreme climate events for 2020 &or 2050 that could contribute to the triggering identified scenarios

Table 4.2 Identified Scenarios and Potential Impacts of Extreme Climate Events (Safety)

Activities	Safety Risks	Temperature	Rainfall
Dredging	Fire	Nil	Nil
	Explosion	Nil	Nil
	Release of toxic substances	Nil	Nil
Filling	Fire	Nil	Nil
	Explosion	Nil	Nil
	Release of toxic substances	Nil	Nil
Operation of Heavy Equipment	Fire	Unlikely, flash point not ambient temperature determining factor	Nil
	Explosion	Not applicable, fuel Not combustible	Not applicable
	Release of toxic substances	Not applicable	Not applicable

Table 4.3 Identified Scenarios and Potential Impacts of Extreme Climate Events (Physical)

Activities	Physical Risks	Temperature	Rainfall
Dredging	Accidents to Construction Personnel	Heat effects on workers	Not Applicable
Filling	Accidents to Construction Personnel	Same as above	Not applicable
Operation of Heavy Equipment	Accidents to Construction Personnel	Same as above	Not applicable

There are no conceivable societal risks from the extreme climate events because (a) there are no population centers in the reclamation area and (b) the reclamation activities will be completed by about 2014 (estimate only).

Societal risks involve a large population shown in the illustration in **Figure 4.2.**

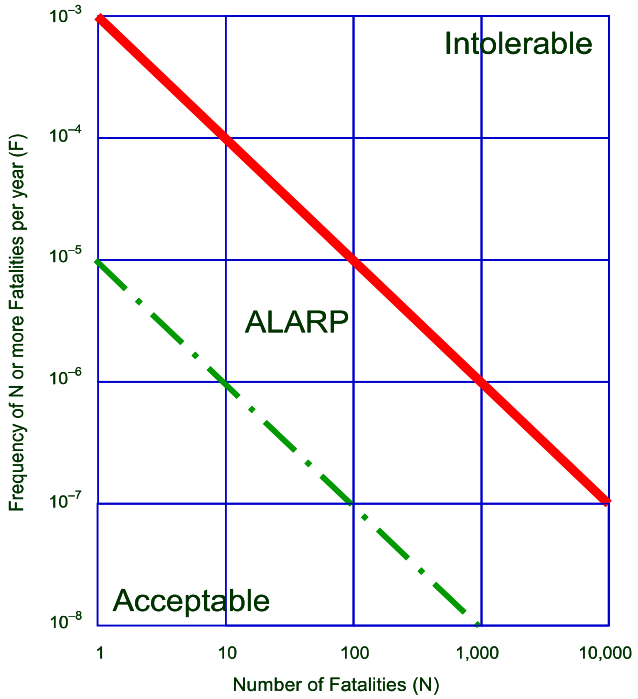


Figure 4.2 Societal Risks *(Source: Annex 2.78 RPM)*

The likelihood of societal risks is thus deemed extremely unlikely considering that a number of fatalities of 1,000 (shown in the above graph) is most unlikely.

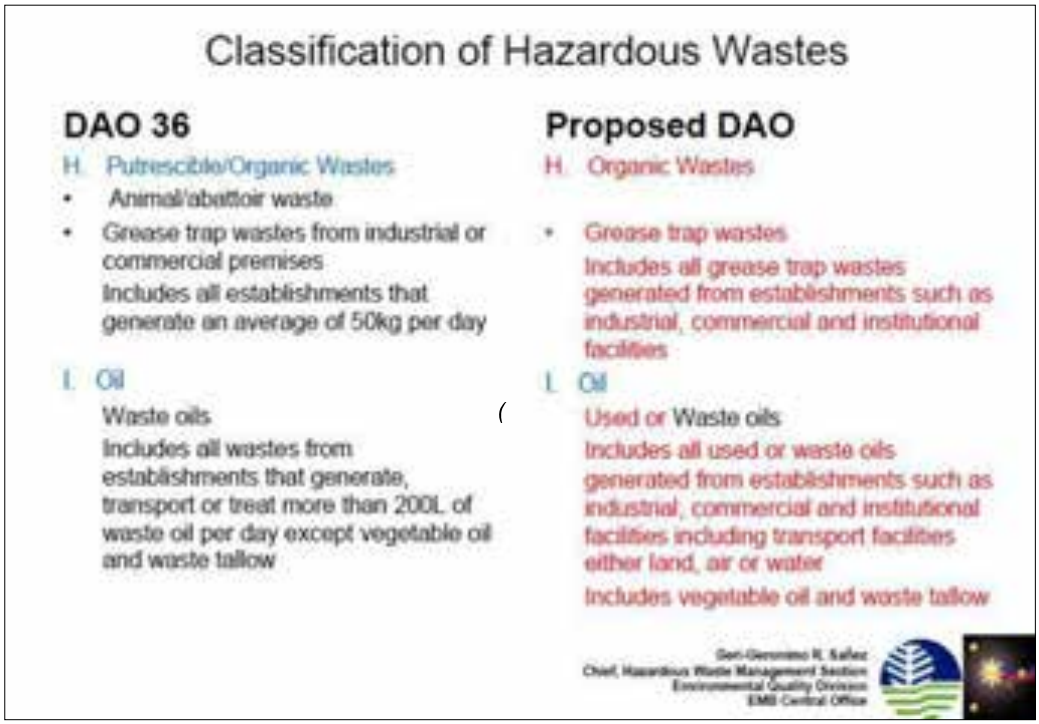
The project site is at Barangay 76 with a population of 5,000. This means that for a societal risk to reach the ALARP ("As Low As Reasonably Practicable") level a 20 % death factor in the population would need to be reached.

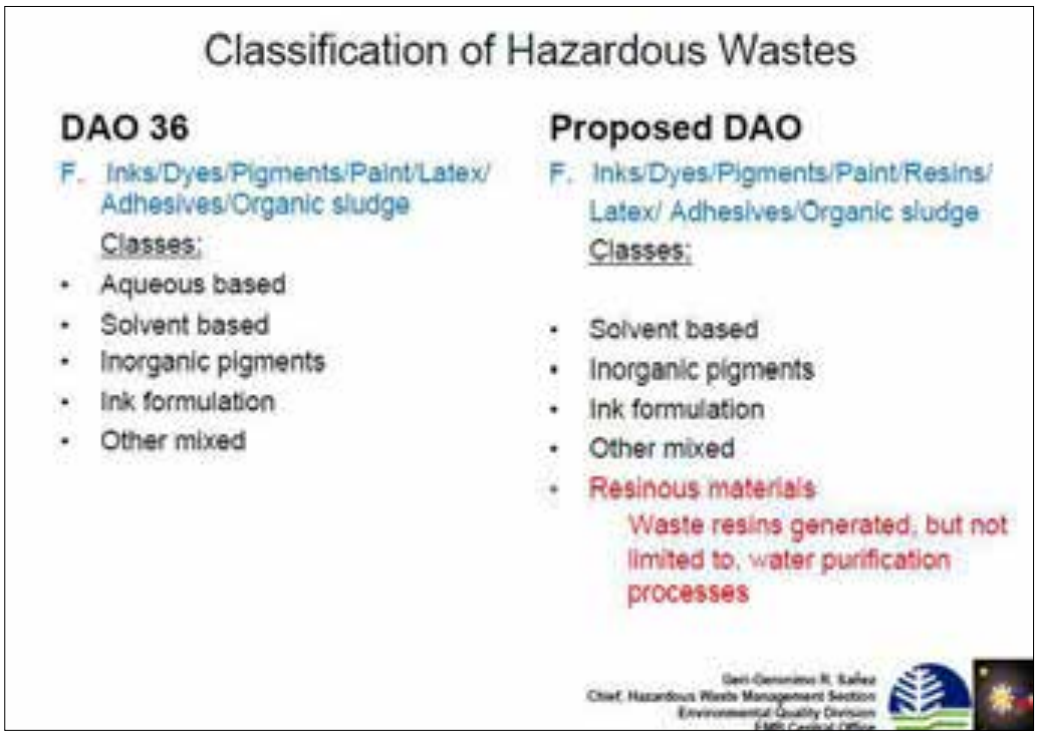
4.1.3 Description of the hazards both immediate (acute effects) and delayed (chronic effects) for man and the environment posed by the release of toxic substances, as applicable.

Descriptive/Qualitative Risk Assessment

By way of reference, typical classification of hazardous wastes is provided in **Plates 4.1**

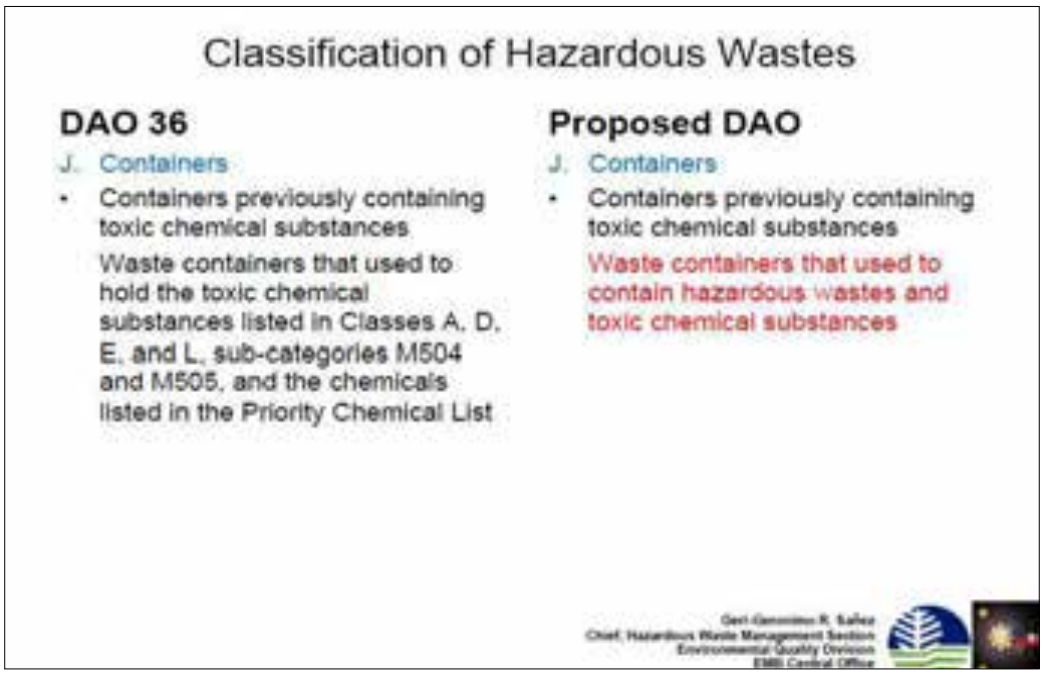
Plates 4.1 Typical Classification of Hazardous Wastes: Current and Proposed

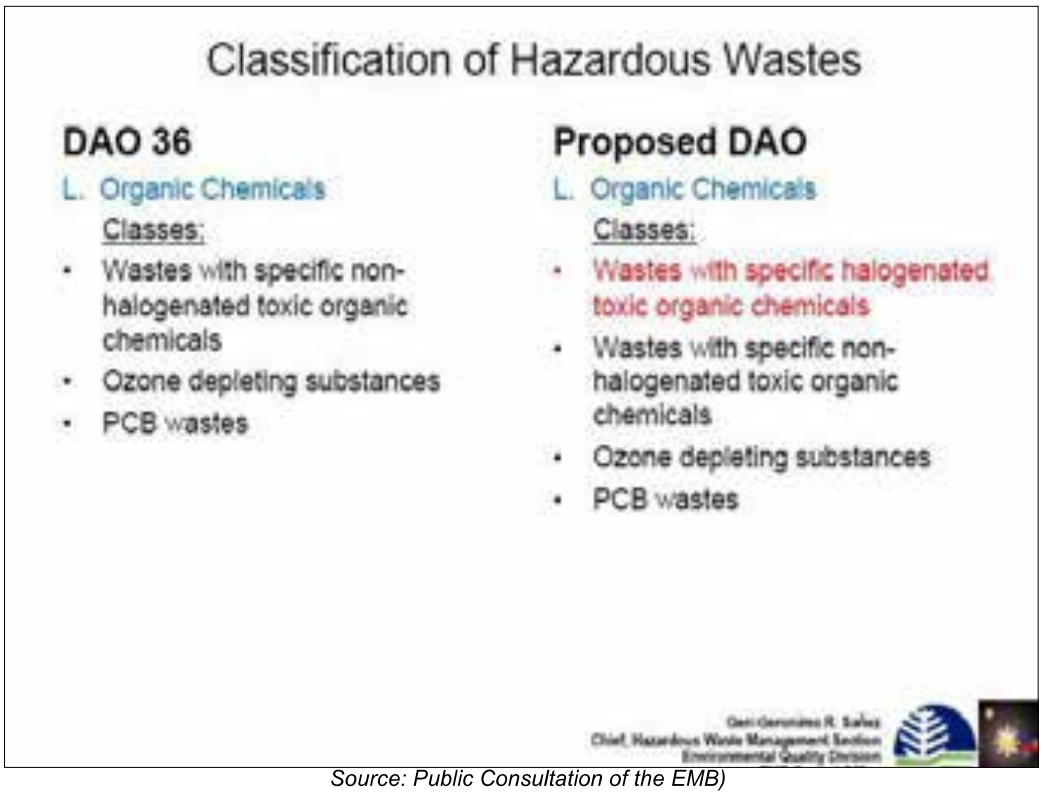




Source: Public Consultation of the EMB)

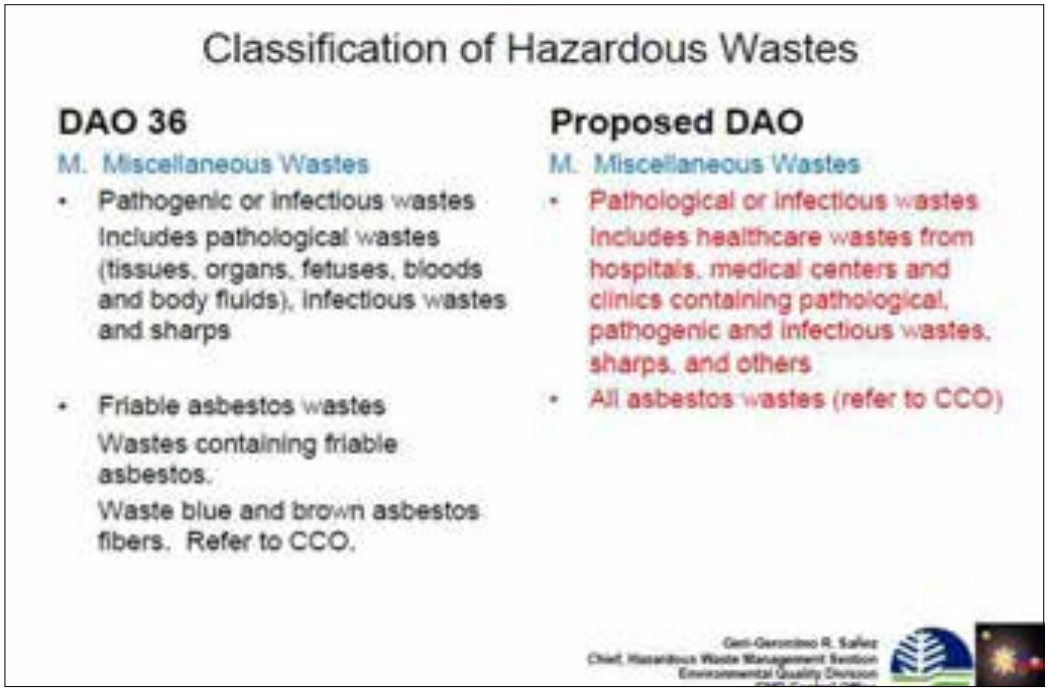
Plates 4.1 Typical Classification of Hazardous Wastes: Current and Proposed

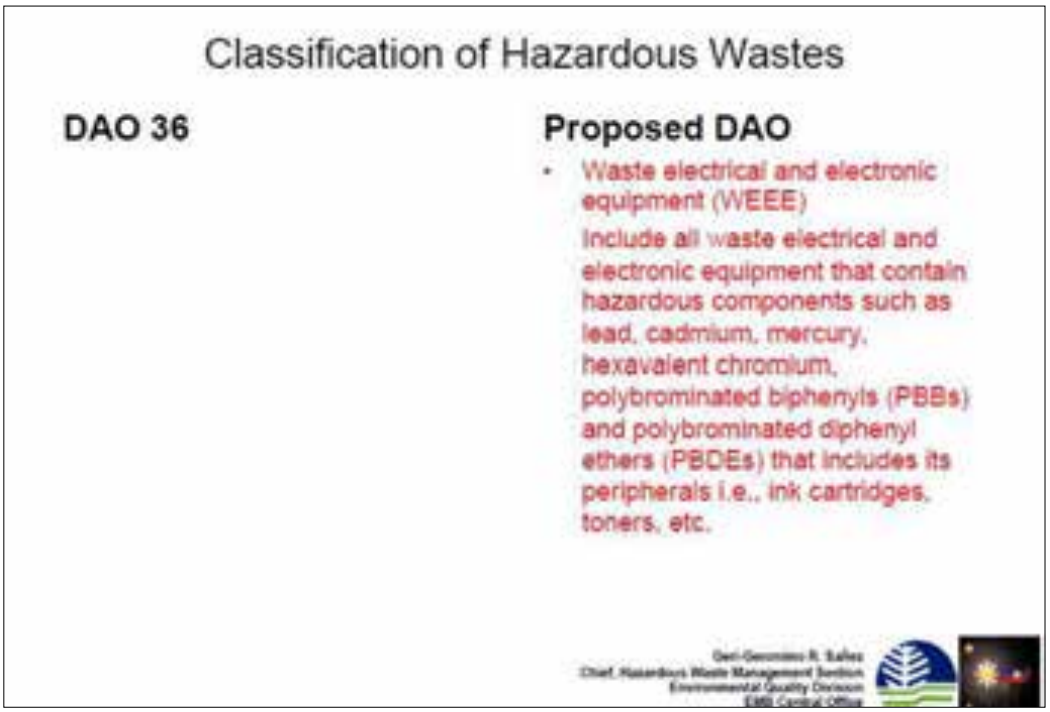




Source: Public Consultation of the EMB)

Plates 4.1 Typical Classification of Hazardous Wastes: Current and Proposed





Source: Public Consultation of the EMB)

4.1.3.1 Chronic Risks

Concentrations of Toxic/Hazardous Substances (i.e. cyanide, mercury, etc.) in Water

The use of generation of significant quantities of toxic and hazardous substances is considered nil in the project as these are not involved in the activities of the proposed project particularly during the reclamation/ construction phase.

The risk factor that needs to be carefully identified during the construction phase is the potential contamination of the Bay with toxic and hazardous substance that may be present from filling materials.

If the filling materials would be sourced from Manila Bay itself this risk is greatly reduced or would be absent. Pre-screening of any filing materials to be used would be mandatory; complete chemical analysis for toxic elements e.g. cyanide, mercury, lead, chromium, etc. must be necessarily undertaken.

The use of and sourcing of the filling materials from its likely source, i.e. the San Nicholas Shoal in Cavite is to be subject to prior permits and clearances from the Philippine Reclamation Authority. One of the requirements for securing such permits/clearances is an ECC.

Notwithstanding that the import of filling/burrows are to undergo strict screening and evaluation, mitigation measures will nevertheless will put in place for dispersal of silts/disturbed sea beds. The use of containment sheet piles along the perimeter of the project will further ensure that any toxic/hazardous substances will not disperse beyond the reclamation area.

Concentrations of Toxic/Hazardous Substances (i.e. cyanide, mercury, etc.) in Air and Land

These substances/materials listed below are not considered as highly significant considering the low quantities involved with the nature of the project especially during the construction phase.

Initial Listing of Potential Toxic and Hazardous Substances Involved in the Reclamation Activities

Nature of Substance	Source	Estimated Inventory
Oil Waste	From Use of Diesel Oil in Dredging Vessel	≈ 10 drums
Spent Lighting Fixtures	From Dredging Vessel	10 units
	From street lighting during soil stabilization phase	25 units
Computer Parts Scraps	From onsite office	100 kg
Spoiled Food Wastes	From construction workers abroad dredging vessel	Minimal (daily disposal)

The potential presence of toxic/hazardous substances in the fill materials is not included in the above list because the fill materials may be sourced from Manila Bay itself, i.e. the San Nicholas Shoal. All fill materials will be subject first to prescreening which will include tests of the presence of toxic and hazardous substances.

During the operations phase there will be generated the common materials designated under RA 6969 as being hazardous. These will include the following:

a. Spent lighting fixtures which may contain metallic elements;

These are disposed through third-party accredited TSD (Treatment, Storage and Disposal) companies accredited with the EMB.

b. Mobile Source Air Toxics (MSATs)

These are generated by vehicles and may include benzene, aromatics, aldehydes, polycyclic aromatic benzenes, and other hydrocarbons inherently present in fossil fuels

The use of clean fuel such as Euro IV P gasoline or diesel oil should be encouraged.

4.1.3.2 Hazard Analysis

The guidelines under the EIA System

The relevant guidelines provided for by the Revised Procedural Manual of DAO 03-30 are as follows and used for hazard analysis.

I. LEVELS OF COVERAGE AND SCOPING REQUIREMENTS

The requirement for the conduct of ERA shall be defined at three (3) levels:

a) Level 2 – for facilities that will use, manufacture, process or store hazardous materials in excess of **Level 2** threshold inventory shall be required to conduct a Quantitative Risk Assessment (QRA) and prepare an Emergency/Contingency Plan based on the results of the QRA.

b) Level 1 – for facilities that will use, manufacture, process or store hazardous materials in excess of **Level 1** threshold inventory shall be required to prepare an Emergency/Contingency Plan based on the worst case scenario. The Plan shall be based on a Hazard Analysis study.

c) Risk screening level – specific facilities or the use of certain processes shall require the conduct of a risk screening study even if the projected or estimated inventory does not reach the threshold levels.

II. TECHNICAL GUIDELINES FOR THE CONDUCT OF ENVIRONMENTAL RISK ASSESSMENT

A. Determination of Risk Levels

1. Levels of Coverage and Requirements

a. Risk Screening Level. The following activities are required to undertake a risk screening exercise:

1) Facilities for the production or processing of organic or inorganic chemicals using:
   a) alkylation
   b) amination by ammonolysis
   c) carbonylation
   d) condensation
   e) dehydrogenation
   f) esterification
   g) halogenation and manufacture of halogens

h) hydrogenation
i) hydrolysis
j) oxidation
k) polymerization
l) sulphonation
m) desulphurization, manufacture and transformation of sulphur-containing compounds
n) nitration and manufacture of nitrogen-containing compounds
o) manufacture of phosphorus-containing compounds
p) formulation of pesticides and of pharmaceutical products.
q) distillation
r) extraction
s) Solvation

2) Installations for distillation, refining or other processing of petroleum products.
3) Installations for the total or partial disposal of solid or liquid substances by incineration or chemical decomposition.
4) Installations for the production or processing of energy gases, for example, LPG, LNG, SNG.
5) Installations for the dry distillation of coal or lignite.
6) Installations for the production of metals or non-metals by a wet process or by means of electrical energy.
7) Installations for the loading/unloading of hazardous materials as defined by RA 6969 (or DAO 29)

2. Levels 1 and Level 2 Threshold Inventory. The following threshold levels shall be used to determine whether a proposed project or undertaking shall be required to prepare a QRA and/or an emergency/contingency plan:

CATEGORY	LEVEL 1 (tons)	LEVEL 2 (tons)
Explosives	10	50
Flammable substances	5,000	50,000
Highly flammable substances	50	200
Extremely flammable substances	10	50
Oxidising substances	50	200
Toxic substances (low)	50	200
Toxic substances (medium)	10	50
Toxic substances (high)	5	20
Toxic substances (very high)	0.2	1
Toxic substances (extreme)	0.001	0.1
Unclassified (Type A)	100	500
Unclassified (Type B)	50	200

Definition of different categories of hazardous materials:

Category	Definition
A. Explosives (Reactivity)	1. A substance or preparation which creates the risk of an explosion by shock, friction, fire, or other sources of ignition.
	2. A pyrotechnic substance (or mixture of substances) designed to produce heat, light, sound, gas, or smoke or a combination of such effects through non-detonating self-sustained exothermic chemical reactions.
B. Flammable Substances	1. Flammable substances are substances and preparations having a flash point equal to or greater than 21*C and less than or equal to 55*C, capable of supporting combustion.
(Highly flammable	2. Highly flammable substances are substances and preparations

and extremely flammable substances)	which may become hot and finally catch fire in contact with air at ambient temperature without any input of energy, or substances which have a flash point lower than 55*C and which remain liquid under pressure, where particular processing conditions, such as high pressure or high temperature, may create major-accident hazards.
	3. Extremely flammable substances are liquid substances and preparations which have a flash point lower than 0*C and the boiling point (or, in the case of a boiling range, the initial boiling point) of which at normal pressure is less than or equal to 35*C; gaseous substances and preparations which are flammable when in contact with air at ambient temperature and pressure, whether or not kept in the gaseous or liquid state under pressure; or, liquid substances or preparations maintained at a temperature above their boiling point.
C. Oxidizing substances	Substances which give rise to highly exothermic reaction when in contact with other substances, particularly flammable substances.
D. Toxic Substances	Low, medium, high, very high and extreme toxicity of substances or preparation are classified as follows:
	1. A substance shall be considered as a liquid if vapor pressure is less than 1 bar at 20*C.
	2. A substance shall be considered as a gas if vapor pressure is greater than 1 bar at 20*C.
	3. The sum of (a) and (b) as provided in Tables 2 and 3 shall determine the toxicity class as contained in Table 1.
E. Unclassified Substances	Substances or preparations that react violently with water (Type A), and substances or preparations which release or liberate toxic gas in contact with water (Type B).

4.1.3.3 Quantitative Risks Assessment (QRA)

Referring to the discussions the threshold levels of inventory which would require a Quantitative Risk Assessment (QRA) is not exceeded hence a QRA is deemed not relevant.

Complete inventory of hazardous wastes, incorporating the inventory in the emergency response plan for hazardous wastes with high risks

Construction/Reclamation Activities in relation to potential hazardous wastes generation.

Dredging. Silts are the solid wastes from the dredging of undesired sea bed materials. All the unwanted silts/sediments are considered wastes, the quantity shall be determined during a survey to be undertaken prior to the reclamation activities.

Filling. The inputs are the fill in materials to be dredged from source, e.g. SNS and the rock materials. There will be no waste or recycle streams. These materials will be first subject to rigorous analysis with respect to potential contamination with hazardous substances. It is envisioned that the sourcing of filling materials will be subject to separate requirements under the PEISS.

Operation in relation to potential hazardous wastes generation.

An inventory is not considered important at this time inasmuch as the potential hazardous wastes associated with the operations phase are not of high risks. This phase is not included in the scope of this EIS and in the application for an ECC.

4.2 Physical Risks

(Failure of Structure w/c could endanger life, property and/or the environment)

Conditions, events and "trigger" which could be significant in bringing about identified physical risks; Description & assessment of the possible accident scenarios; Assessment of whether the project location is projected to have extreme climate events for 2020 &or 2050 that could contribute to the triggering identified scenarios; Description of the hazards both immediate (acute effects) and delayed (chronic effects) for man and the environment posed by the failure of structure, as applicable

The worst case anticipated accident scenarios or potential accidents could occur during the construction phase involving the use of heavy machineries such as dredging equipment, pile driving and others.

The criteria for the choice of the construction contractor(s) will include among others the safety policies and protocol that will be observed.

The summary of the physical risks are given in **Table 4.4.**

Table 4.4 Summary Matrix of Physical Risks

Activities	Physical Risks	Probability of Incident	Prevention/Control Measures
Dredging	Accidents to Construction Personnel	Nil to insignificant	Safety Training of Construction Crews Safe worthy equipment
Filling	Accidents to Construction Personnel	Nil to insignificant	Safety Training of Construction Crews Safe worthy equipment
Operation of Heavy Equipment	Accidents to Construction Personnel	Nil to insignificant	Safety Training of Construction Crews Safe worthy equipment

It is thus concluded that there exists no significant safety risks, further since the activities are confined to the reclamation area and away from population centers there are no societal risks associated.

4.2.1 Emergency Plan

The generic emergency plan consistent with the guidelines in the Procedural Manuals is provided hereunder.

Emergency Response Policy and Generic Guidelines

The potential emergency situations that may arise are the following:

- **Earthquakes** - The project site is located at about 8.00 kilometers west of the western extension of the Valley Fault.
- **Fire**
- **Oil spill** - Oil spill risk may be posed by the dredging vessel carrying oil as fuel for its engines.
- **Strong typhoons -** The project site is situated in an area frequently visited and/or hard-hit by natural such as typhoons.
- **Outbreak of diseases** - It is most likely that the emergency response may involve only the construction personnel and not necessarily the land-based residents.

Since natural risks and hazards are regional in scope and are common to the other reclamation projects adjacent to the Pasay Reclamation Project entries made in other EIS Reports are herein integrated.

The response and procedure will depend on the nature of the emergency and will include the following generic guidelines:

- Establishment of official detailed responses per type of emergency
- The assistance of the National Disaster Management and Coordinating Council could be sought.
- Emergency drills
- Installation or securing of necessary emergency response facilities/equipment, e.g. firefighting system, oil spill containment boom, vehicles for transport of injured personnel, etc.
- Setting up of communication lines, e.g. with barangay, fire department, police department, clinics or hospitals.

Continuing Preparation

Following are the elements of continued readiness

- Organizational Chart for Specific Emergency Situations
- Evacuation routes to be informed the construction personnel
- Availability of first aid kit
- Regular drills, e.g. fire fighting, evacuation, accidental oil spill containment, etc.

During actual emergency:

- Designation of on-site emergency marshal
- Communicating with outside parties for help when necessary
- Execution of emergency procedure

After emergency

- Audit or investigation of cause of emergency, if man-made such as fire, oil spill, etc.
- Assistance to injured people

The Manual for Emergency Response and Preparedness Action Plans may be started before the construction phase when the engineering design and details for the reclamation works shall have been known.

Societal Risks

These are considered remote since the project will be located at sea without any population centers or settlers.

4.2.2 Natural Risks and Hazards

By way of definition**, risks** as defined by Meriam-webster.com are the possibility that something bad or unpleasant such as an injury or loss will happen. It is also defined as someone or something that creates or suggests a hazard.

On the other hand, **hazard** as defined by Wikipedia.com is a situation that poses a level of threat to life, health, property, or environment. Hazard and possibility interact together to create risk.

As discussed in previous sections this EIS Report and the ECC application being made is for the reclamation works (Construction Phase of the EIS cycle) and the Operations Phase may be subject to separate requirements of the PEISS. Thus focus is necessarily made on the horizontal developments.

Since natural risks and hazards are regional in scope and are common to the other reclamation projects adjacent to the Pasay Reclamation Project entries made in other EIS Reports are herein integrated.

GEOLOGICAL AND OTHER HAZARDS

In contrast to Environmental Risks, geological risks are evaluated using the Geological Hazard Assessment protocol.

*(The third aspect of risks is **health risk** which is characterized by high probability, low consequence, ongoing or continuing exposure and chronic human health effect. This is assessed in the Environmental Health Impact Assessment or EHIA under the Department of Health (DOH) mandate. Prior to project implementation which is post ECC the DOH may likely be asked for Letter of No Objection to the Project).*

4.2.2.1 Regional Setting

Methodology

Geologic assessment comprised of collation of existing geologic and hydrographic survey reports and literature of the project area; interpretation of topographic, geologic, hydro geologic and hydrographic maps; and actual field verification of rock units and geologic structures of a nearby site.

Actual field survey comprised of geological mapping at the periphery of the project location. Mapping includes identification of rock types inherently underlying the project area and vicinity and, if possible, determination of rock orientation (attitudes) and characteristics.

Nature/Source of Information

The geological assessment commenced with literature research of all available geological, seismological, hydrological and hydrographical reports and maps covering the project area previously conducted at the Mines and Geo-Sciences Bureau (MGB), the Philippine Institute of Volcanology and Seismology (PHIVOLCS), the University of the Philippines-National Institute of Geological Sciences (UP-NIGS) and National Water Resources Bureau (NWRB).Topographic maps covering Pasay City and vicinity were acquired from the National Mapping and Resource Information Agency (NAMRIA). Climatological data was gathered from the Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA).

4.2.2.2 Tectonic Setting

The Philippine Island Chain has evolved from the collision between the Eurasian Plate, South China Sea Plate, the Philippine Sea Plate, and the Pacific Plate. The collision resulted to several subduction zones marked by oceanic trenches. The development of the archipelago was caused by the active squeezing and magma rise producing a chain of volcanoes from the remelting of the sub ducting lithosphere.

The Philippine Sea Plate is being sub ducted on the east side of the archipelago along the Philippine Trench and the East Luzon Trench. On the other side of the archipelago, the seafloor

of the South China Sea Plate sub ducts near the west side of Luzon along the Manila Trench, producing an opposite dipping subduction zone. On the southwest, the seafloor of the Sulu Plate sub ducts near the west side of Negros Island along the Negros Trench and along Sulu Trench near the northwest side of Zamboanga. The Celebes Sea Plate sub ducts near the west side of Central Mindanao along the Cotabato Trench and in Davao Gulf along the Davao Trench.

As a result of the colliding and sub ducting plates, a broad zone of active deformation characterized by pronounced seismicity and volcanism runs longitudinally throughout the entire length of the archipelago. Convergence is farther absorbed by internal deformation along the 1,600 kilometers long Philippine Fault, a major strike-slip fault extending from Lingayen to Davao.

Metro Manila lies on the western central part of the island of Luzon within the so-called "Philippine Mobile Belt" (PMB), a mobile and highly seismic belt that transects the archipelago. The Philippine Mobile Belt, especially along the Philippine Fault Zone (PFZ), absorbs the continuing crustal plate deformation.

The Philippine Fault Zone, a 1,600-kilometers long strike-slip fault that sinuously trends north to northwest from Luzon to Mindanao transects the Philippine archipelago.

About one-third of the destructive earthquakes that have affected Metro Manila and vicinity were generated from the Philippine Fault Zone. The movement of the Philippine Fault Zone produced the majority of the most devastating earthquakes in the Philippine history including the 16 July 1990 earthquake event. The 1990 earthquake generated from the PFZ's northern segment, the Digdig Fault, was recorded at MS 7.8

The project site is found about 8.00 kilometers west of the western extension of the Valley Fault System, a geomorphological active fault that extends southward along the Marikina Valley to Western Laguna and gradually curves towards the west as it approached the Batangas-Cavite boundary at Tagaytay Ridge. Recent investigation by PHIVOLCS along the Sucat-Muntinlupa-Alabang stretch have confirmed the existence of creep (active fault movement) along what is believed to be a step-over segment of the fault there (Rimando et al, 1995).

Other significant geologic structures in the region include the Philippine Fault Zone and its branches and Lubang Fault found between Batangas and Mindoro Island and Manila Trench found west of Luzon Island.

The geologic map of the vicinity of the project site is shown in **Figure 4.3** while the map of the active faults and liquefaction potential in Region 4-A which includes the project site, is provided in **Figure 4.4 page 4-17**.

The coastal plain in the vicinity of the site is underlain by recent coastal and alluvial deposits from the Pasig River which consist of unconsolidated sands, silts and clays.

The seismicity map of the vicinity of the project site is shown in **Figure 4.5 page 4-18.**

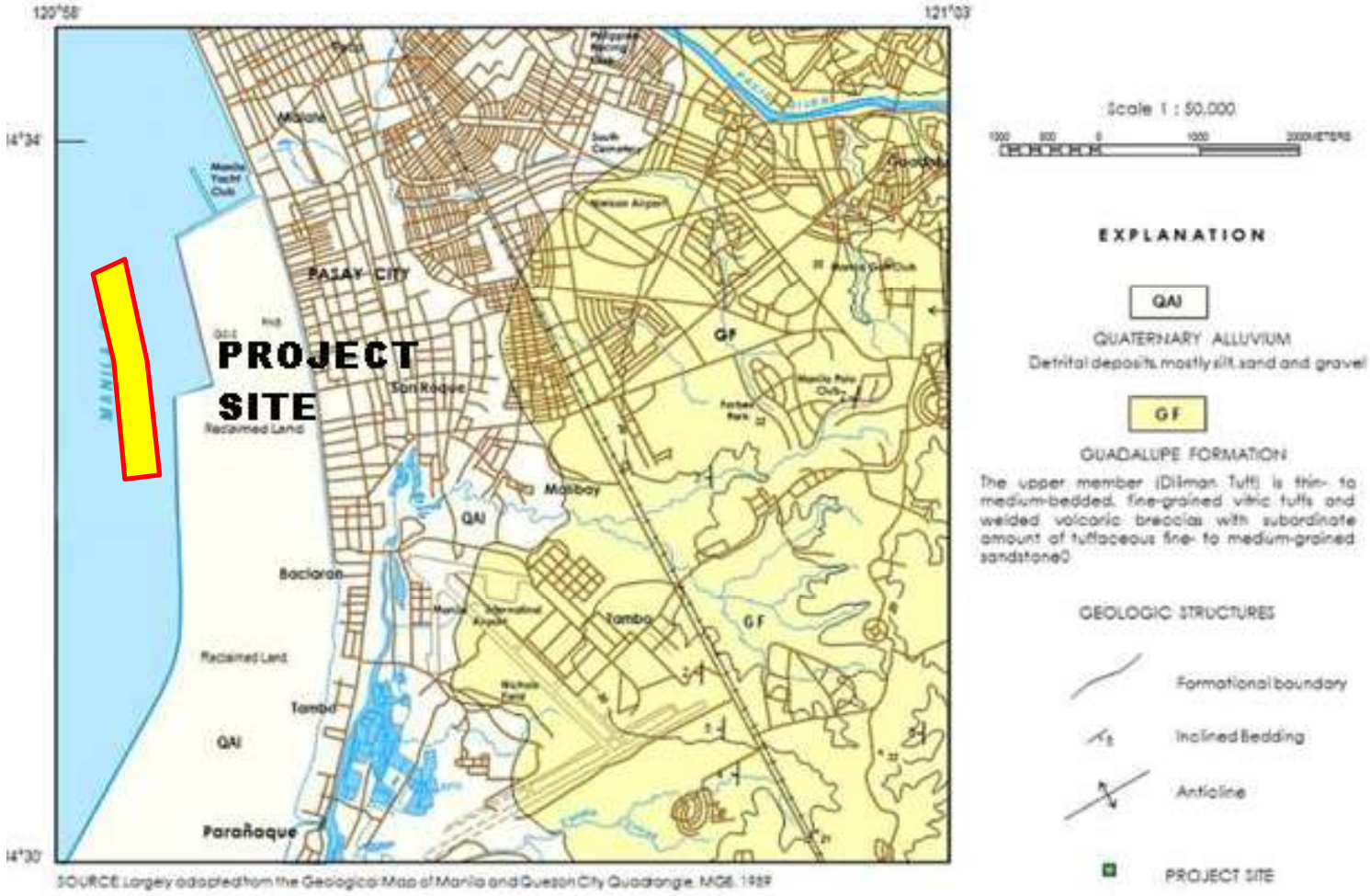


Figure 4.3 Geologic Map of the Vicinity of the Project Site

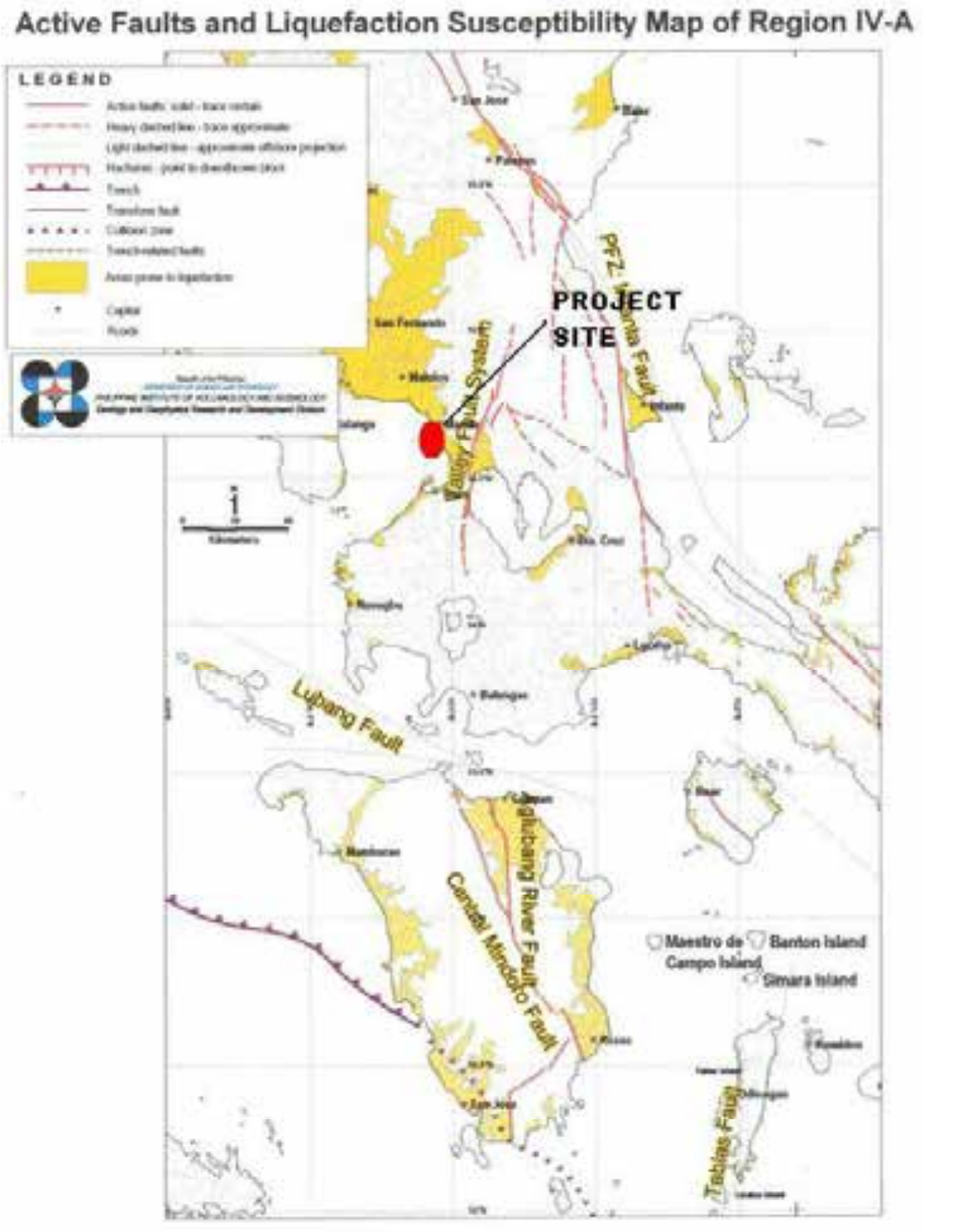


Figure 4.4 Active Faults and Liquefaction potential in Region IV-A

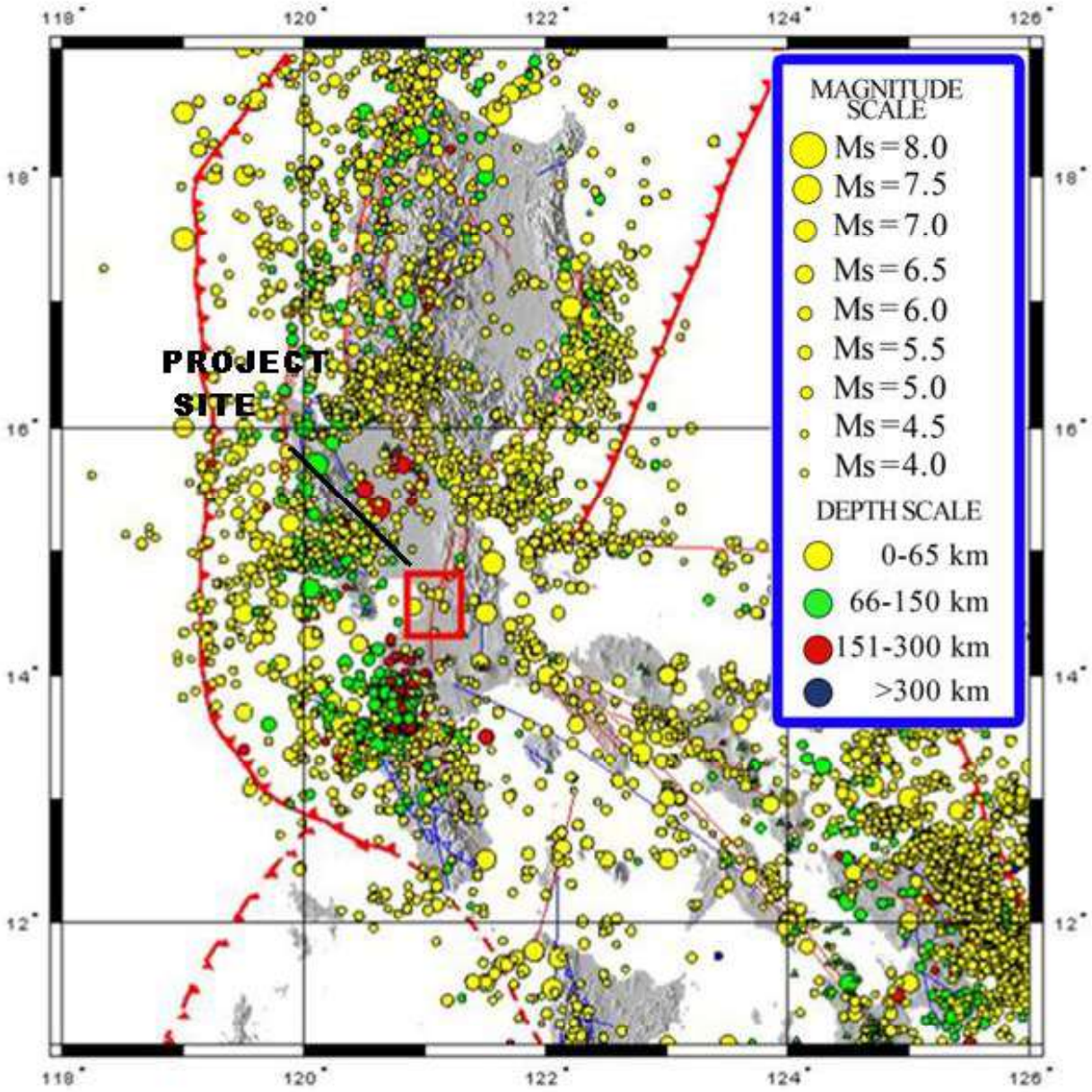


Figure 4.5 Seismicity Map of the Vicinity of the Project Site

A record of the recent earthquakes affecting the Manila region is shown in **Table 4.5** below:

Table 4.5 Recent Earthquakes Recorded In/Close to the Metro Manila/Laguna Lake Regions

DATE	MAGNITUDE	EPICENTER
2012		
October 31, 2012	3.8	Dona Remedios Trinidad, Bulacan
October 4, 2012	5.3	Mambuao, Occidental Mindoro
Nov. 1. 2012	3.8	Dona Remedios Trinidad, Bulacan
June 17, 2012	4.0	Candelaria in Zambales
2011		
Feb. 21, 2011	4.7	NW of Nasugbo, Batangas
March 21, 2011	4.0	Occidental Mindoro
May 23, 2011	4.0	Lubang Island, Mindoro
April 9, 2011	3.0	Lubang Island, Mindoro
July 25, 2011	5.9	West of Angeles, Pampanga and North of Olongapo City
November 30, 2011	2.0	Dagupan
2010		
March 25, 2010	5.0	Lubang Island, Mindoro
January 12, 2010	4.0	30 meters SW of Olongapo

From the above table may be gleaned that the recently-recorded earthquakes are of magnitude less than 7.0, consistent with the seismicity map in **Figure 4.5**, **page 4-18.**

Table 4.5 provides reference information, it does not necessarily follow that the occurrence or not of an earthquake and the magnitude thereof will be necessarily related to recent episodes.

4.2.2.3 Peak Ground Acceleration (PGA)

Ground acceleration caused by earthquakes if not properly addressed in engineering and design may potentially result to great damage and destruction to property and infrastructure and maybe accompanied by loss of life. Factors that influence the intensity of ground shaking include the following: magnitude of the earthquake, distance of the site in relation to the earthquake generator, characteristics of the underlying rocks and the soundness of the buildings/structures.

The Philippines is a tectonically active place with noted active faults that are usually the source of major earthquakes. This is reason why the Philippine Institute of Volcanology and Seismology (PHIVOLCS) and the United States Geological Survey (USGS) conduct ground motion hazard mapping in terms useful to engineering design using modern probabilistic methodology. In the study, the peak horizontal ground accelerations that have a 10 % probability of being exceeded in 50 years have been uniformly estimated for rock, medium soil and soft soil site condition. Results of the study show an estimate on rock ranging from a low of 0.11g in Visayas to a high of 0.30g in the vicinity of Casiguran fault zone in eastern Luzon (Thenhaus, et al).

The project site, which is reclaimed land is considered to be underlain by alluvial deposits and falls under the 0.80g as shown in the delineated Acceleration Map for Soft Soil by Thenhaus, et al.

In the 2004 report entitled “Earthquake Impact Reduction Study for Metropolitan Manila, Republic of the Philippines” (MMEIRS) by PHIVOLCS, the Metropolitan Manila Development Authority (MMDA) and the Japan International Cooperation Agency (JICA), maps of the PGA potential of Metro Manila show that the PGA values for the project site are **0.30-0.60g** for a 7.2 magnitude earthquake along the West Valley Fault (Scenario 8) and a 6.5 magnitude historical earthquake

that occurred in 1863 (Scenario 18) and **0.15-0.30g** for a 7.9 earthquake along the Manila Trench (Scenario 13) (Figure 4.5, page 4-18). The nearest active fault to the project site is the West Valley Fault found about 8.00-kilometers the southeast. The study of this structure by Nelson et al (2000) concluded that the chance of an earthquake larger than *M7* on the two faults of the Valley Fault System is seemingly small. However, in the MMEIRS and clarification letter of PHIVOLCS, ***a M7.2 earthquake is the estimated largest credible earthquake that can be generated by movement of the Valley Fault System,*** based on available geological and seismological data.

Using the deterministic method of Tanaka and Fukushima with the following attenuation relation:

$$\mathbf{Log_{10}A = 0.41M\text{-}log_{10}\,(R + 0.032 \times 10^{0.41M}) - 0.0034R + 1.30}$$

Where: A= mean of the peak acceleration from two horizontal components at each site (cm/sec^2)
R= shortest distance between site and fault rupture (km)
M= surface-wave magnitude

Considering an earthquake magnitude of *7.2* and distance of the site of 8.00-kilometers to the West Valley Fault, the nearest active fault, the following peak ground acceleration (PGA) values of 0.280g, 0.406g, and 0.649g for bedrock, medium soil and soft soil, respectively were

0.858g for soft soil (alluvium) and
0.537g for medium soil (tuff).

The choice of the PGA factor must be made judiciously. Very conservative values may impact on project cost; however, liberal values may compromise safety. It may be noted, however, that notwithstanding the seismic characteristics in the Metro Manila region there are known structures/buildings which are built very close to the WVF but which have not to date suffered any damage from ground accelerations.

Considering an earthquake magnitude of *7.2* and distance of the site of 8.00-kilometers to the West Valley Fault, the nearest active fault, the following peak ground acceleration (PGA) values of 0.280g, 0.406g, and 0.649g for bedrock, medium soil and soft soil, respectively were computed as shown in **Table 4.6** below. The project site being reclaimed land will fall under the soft soil condition and will experience **0.649g.**

Table 4.6 Computed PGA values of different earthquake generators

Earthquake Generators	Magnitude	Distance	Calculated PGA (g) Values		
			Bedrock	Medium Soil	Soft Soil
West Valley Fault	7.2	8.00	0.280	0.406	0.649
Philippine Fault Zone	8.0	67.00	0.108	0.156	0.249
Lubang Fault	8.0	75.00	0.095	0.138	0.22
Manila Trench	8.0	200.00	0.019	0.027	0.043

The acceleration maps for soft and medium soils are shown in **Figures 4.7** and **4.8** respectively.

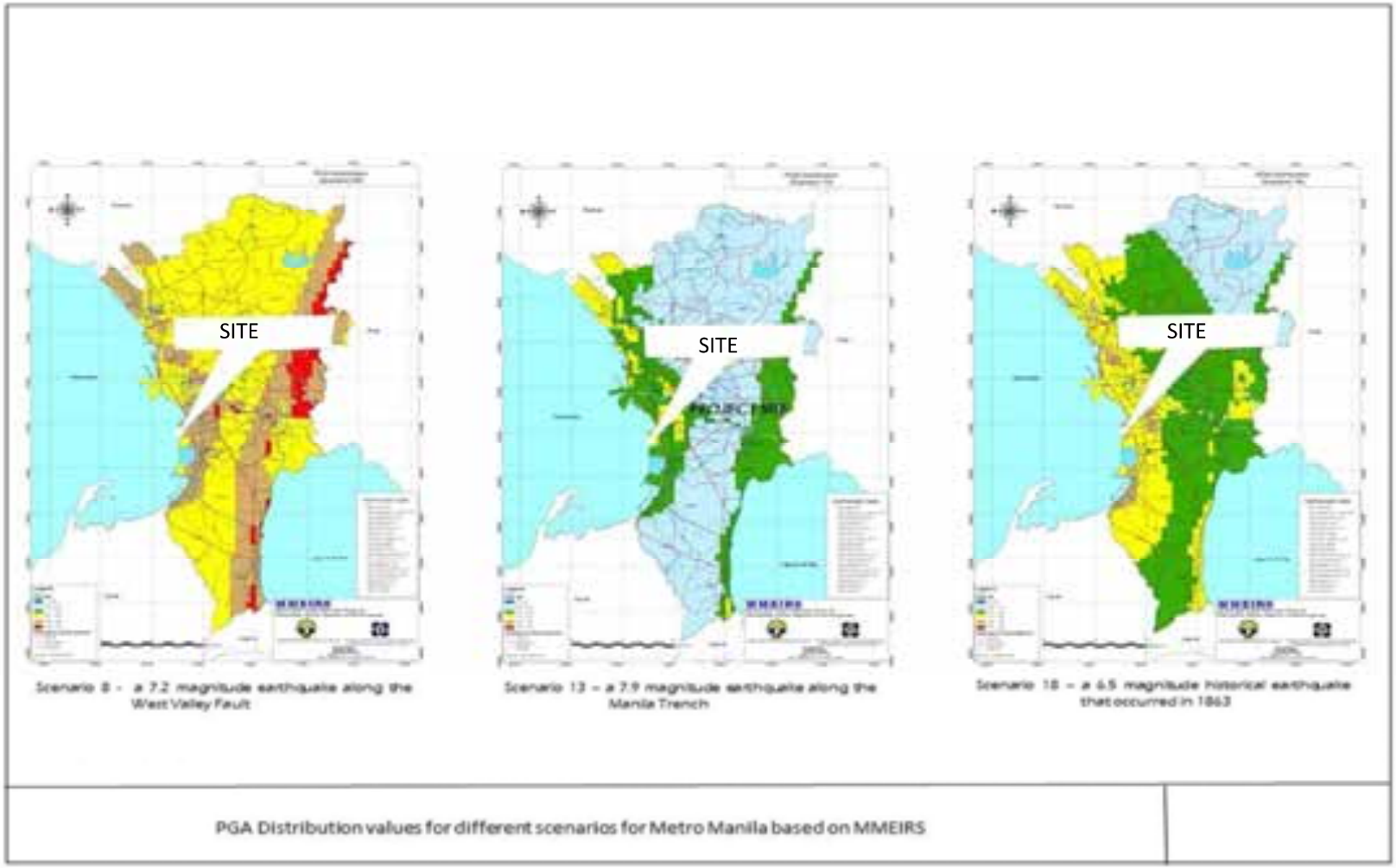


Figure 4.6 PGA Distribution Values for Metro Manila Based on MMEIRS

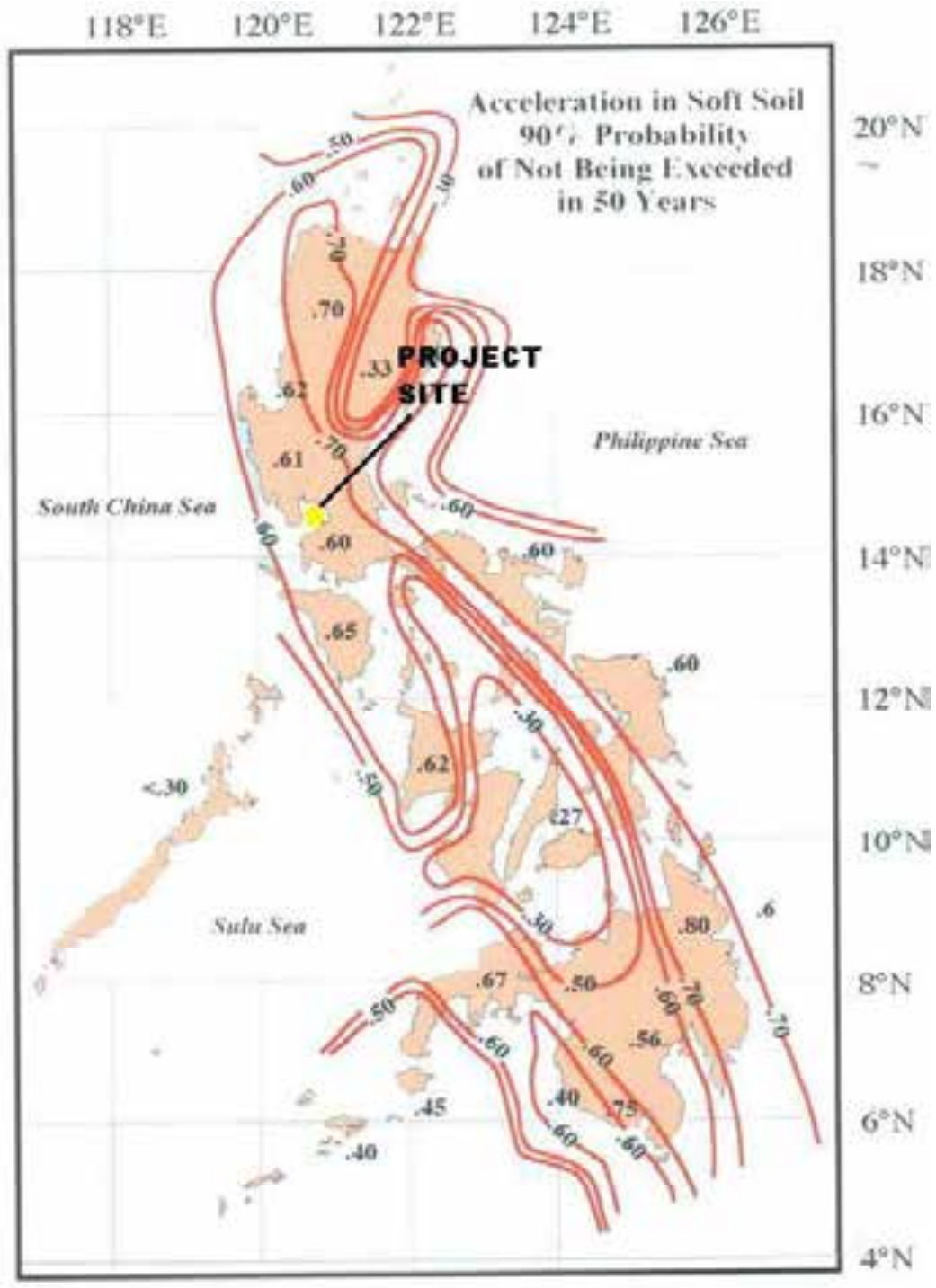


Figure 4.7 Acceleration in Soft Soil (Source: PhiVolcs)

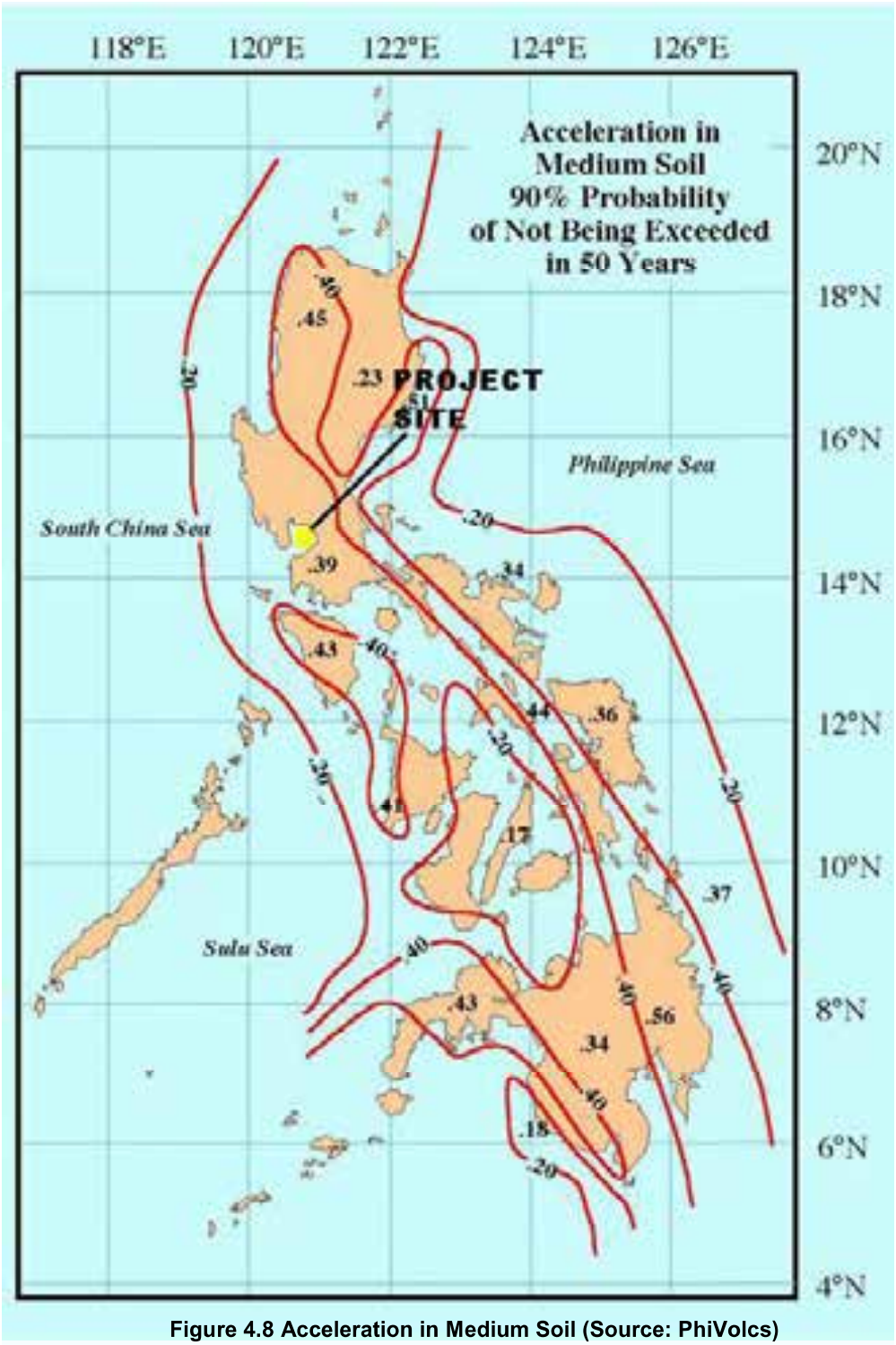


Figure 4.8 Acceleration in Medium Soil (Source: PhiVolcs)

4.2.2.4 Liquefaction

Liquefaction is a process that transforms the behavior of cohesion less soil from a solid to a liquid (Seeds, 1979). It usually affects loosely-packed and water-saturated sediments.

Liquefaction occurs in water-saturated unconsolidated sediment due to shaking. In areas underlain by such material, the ground shaking causes the grains to lose grain to grain contact, and thus the material tends to flow. This is illustrated in **Figure 4.9** below.

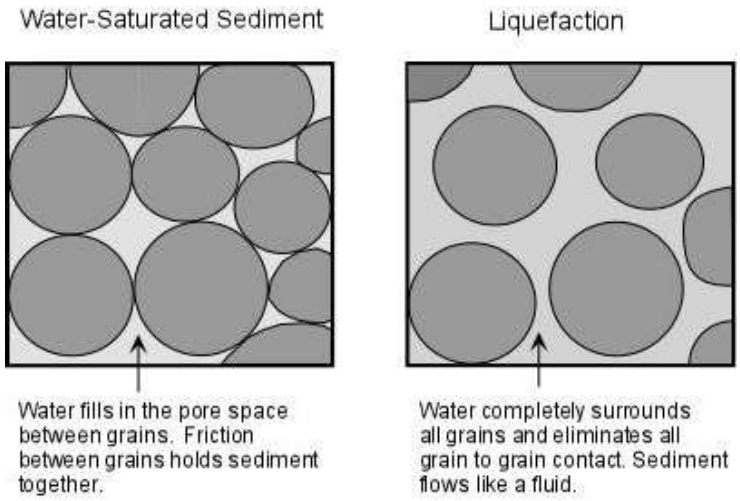


Figure 4.9 An Illustration of the Liquefaction Process

Earthquakes, with magnitude as small as 5.5, can induce liquefaction hazard and can affect areas hundreds of kilometers away from its epicenter. Lakeshore areas underlain by alluvial deposits in the area are classified as highly susceptible to this hazard. However, areas underlain by the tuffs are rated low in respect to susceptibility. This hazard can be mitigated through proper and appropriate structural design and by laying the foundation into the tuff rock formation.

The proposed project being a reclamation area located along shoreline of the Manila Bay is susceptible to liquefaction. It falls on the delineated moderately prone area for liquefaction by PHIVOLCS (**Figure 4.10 and Figure 4.11**).

Liquefaction occurs when a water-saturated cohesion less soil loses its strength and liquefies when subjected to intense and prolonged ground shaking. Reyes et al, of UP-Engineering Research and Development Foundation, Inc., in their soil study of areas that liquefy during the 16th July 1990 Luzon earthquake came out with the following soil conditions for the potential liquefiable layers:

(1) loose soil classification;
(2) upper layers of the surveyed areas;
(3) water table near the ground surface;
(4) N-value of less than 30 using the American Association of State Highway and Transportation Officials (AASHTO) method and less than 35 using the Japan Society of Civil Engineers (JSCE) method; and
(5) 50% passing (D50) of approximately 0.001-1.8mm.

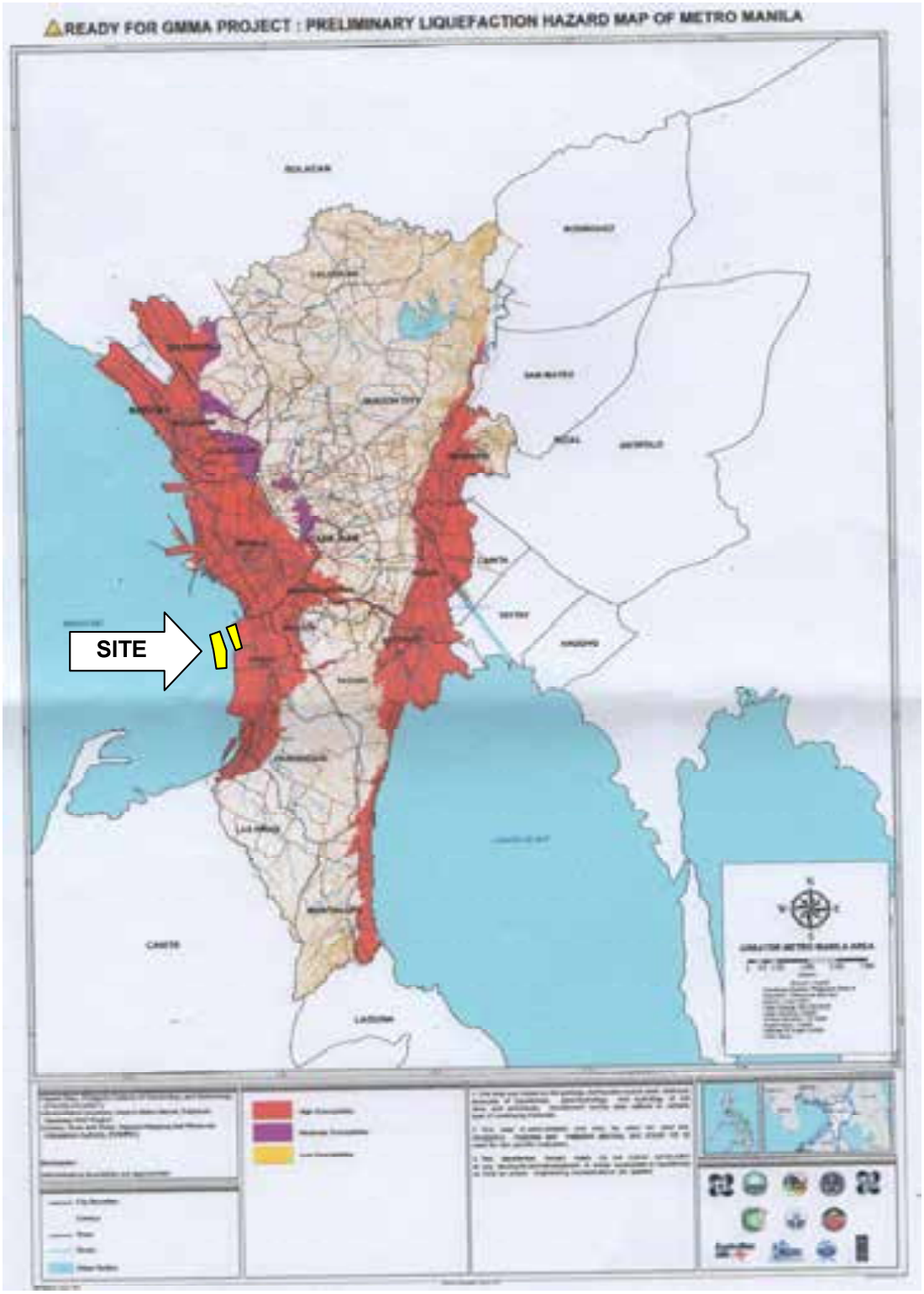
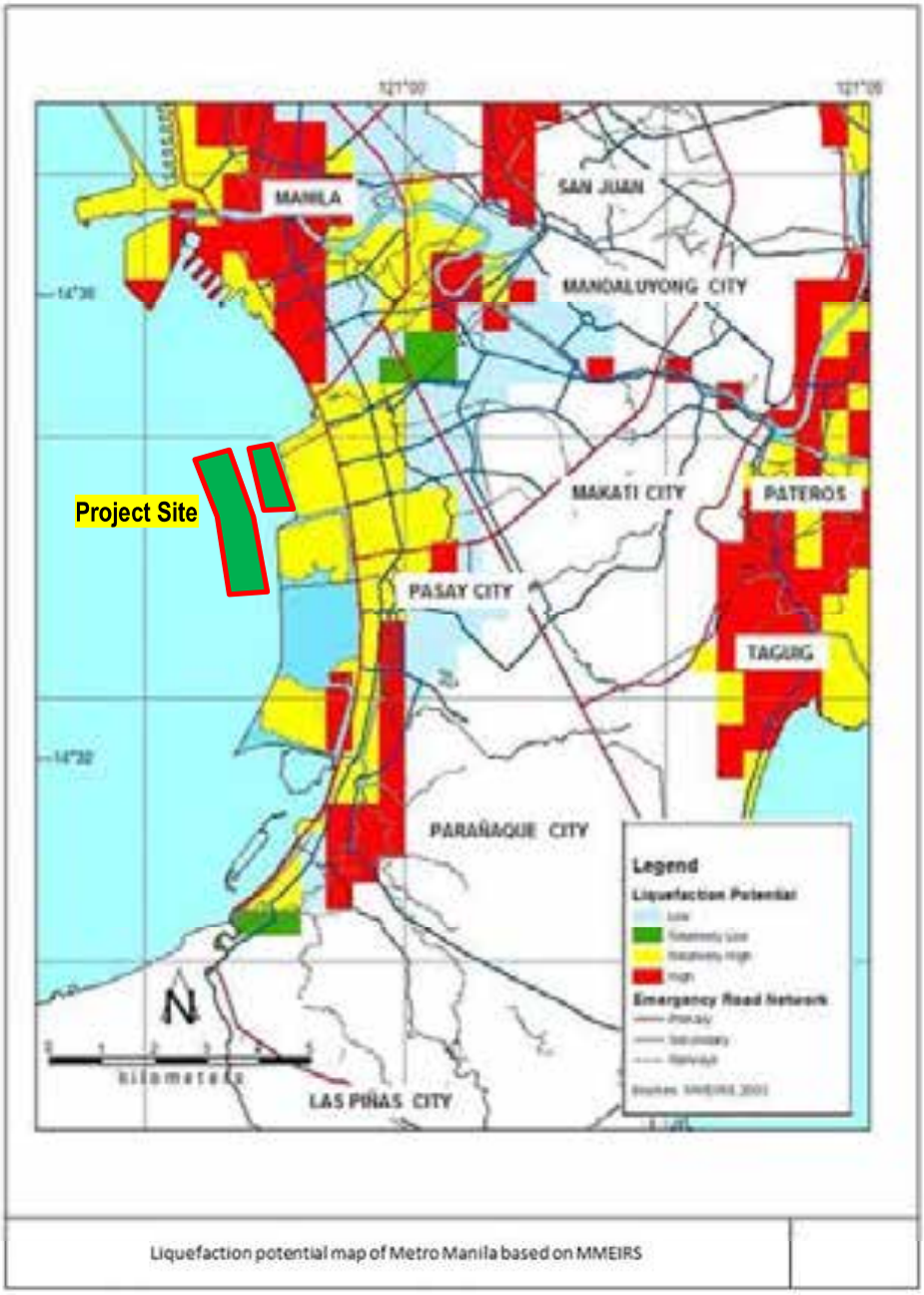


Figure 4.10 Liquefaction Hazards Map of Metro Manila



Liquefaction potential map of Metro Manila based on MMEIRS

Figure 4.11 Liquefaction Potential Map of Metro Manila Based on MMEIRS

Differential Settlement

Differential settlement is the unequal settling of materials; gradual uneven downward movement of foundations due to compression of soil during loading or ground shaking arising from an earthquake event. This hazard is naturally present in in-filling activities

Failures could occur where the magnitude of the external environmental forces such as seismicity that tend to deform or weaken the filled materials such as in reclaimed lands exceed the properties of the filled materials (such as the sediment-deposition patterns or methodology) that tend to resist such deformation.

Enough experiences are available in the Philippines for engineering interventions to address this concern.

4.2.2.5 Other Natural Hazards

The other aspects of the Engineering, Geological and Geohazard Assessment (EGGA) included in the protocol of the MGB are considered of lesser significance as discussed below.

The combine risk/hazard map for the Philippines, shown in **Figure 4.13**, **page 4-29** does not indicate any major hazards in the Laguna Lake Region which include the following aspects:

4.2.2.6 Hydrological Hazards

- **Flooding**

As discussed in the previous section, flooding may be caused by heavy rainfall such as during typhoons which are restricted from flow to the ultimate discharge basin, i.e. the Manila Bay due to the impediments in the drainage morphology discussed in **Section 2.2.1.1.1.** The project does not block, impede or disturb the drainage system and thus does not impact on the occurrence of flooding. The 200-meter buffer zone between the 300-hectare reclamation and the shore and the northern boundary of the 60-hectare reclamation provides a much wider drainage area than that of the Libertad Channel itself.

The other cause of flood is storm surge which could bring about flood water from the sea. The project is not a cause of storm surges and in fact could shelter the shore areas from flood as discussed in **Section 2.2.2.2**.

Flooding will not likely have impact on the reclaimed because of its high finished platform level of 3.5 meters above mean sea level (MAMSL).

Moreover, the historical flooding event of significance is that brought about by Typhoon Ondoy. The flow of the storm waters during this event is shown in **Figure 4.12** indicating therein that the project site is not in the path of the flood waters.

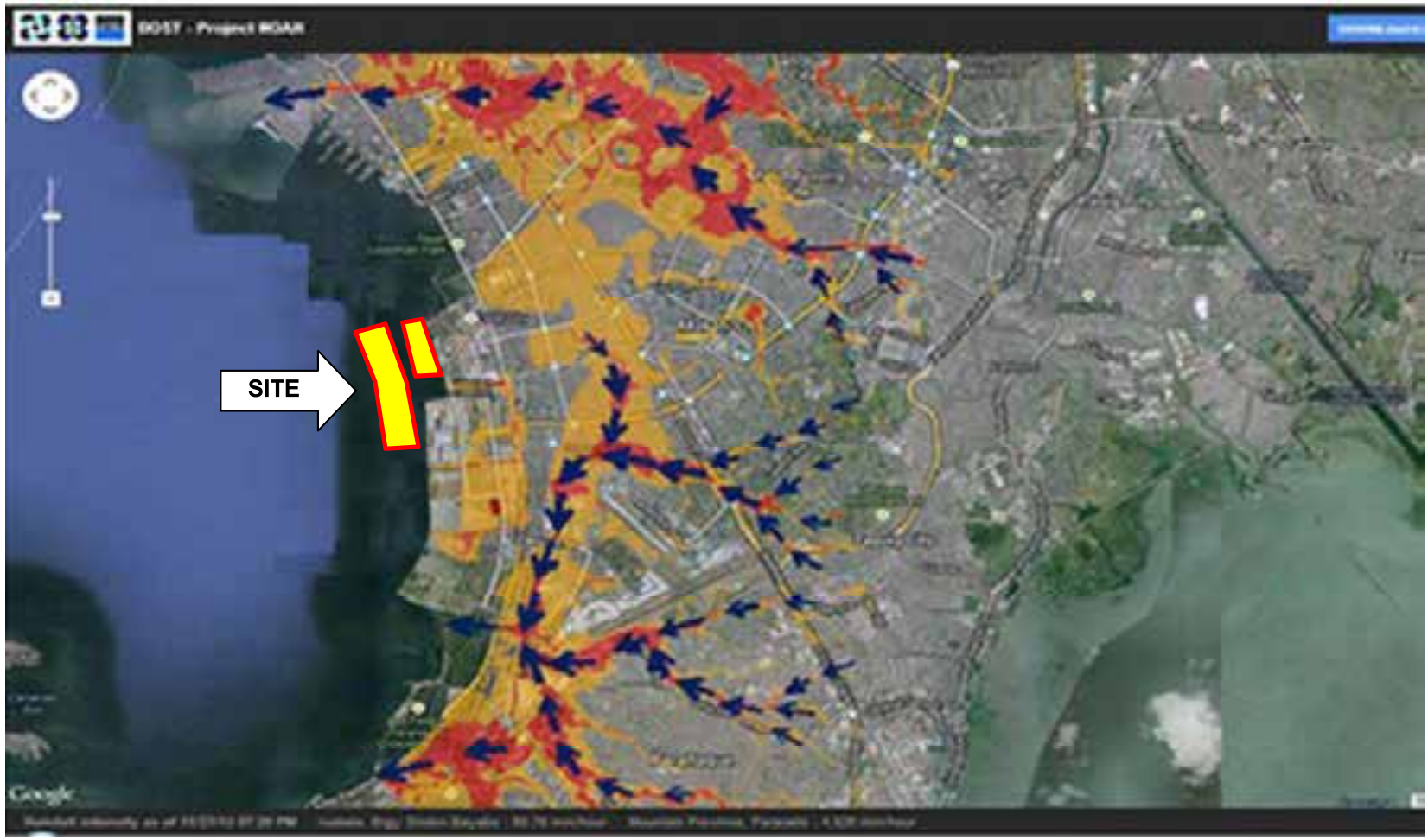


Figure 4.12 Pathway of the Ondoy-Induced Flood waters

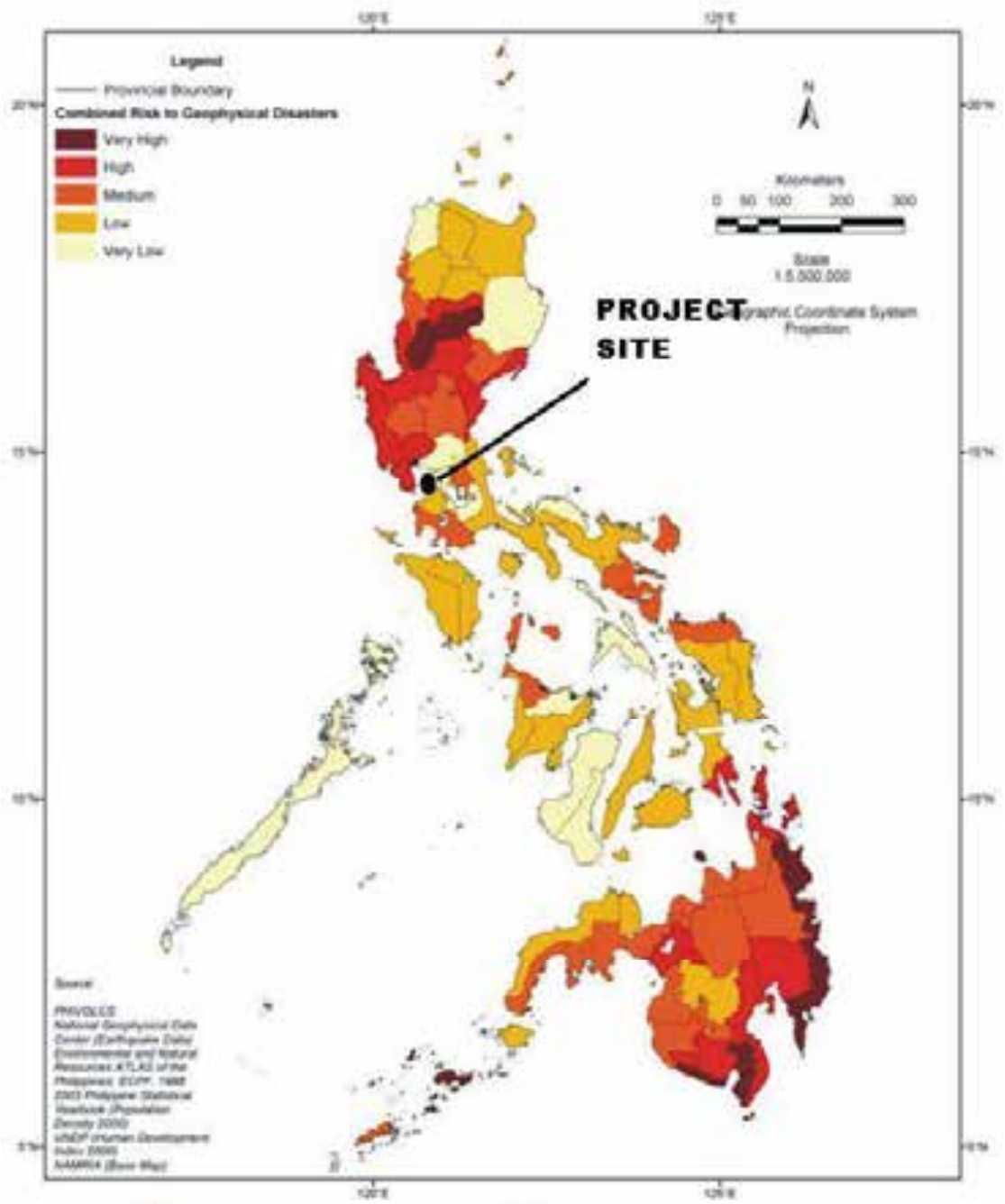


Figure 4.13 Map of Combined Risks to Geophysical Disasters

4.2.2.7 Climatological hazards

Entries made in other EIS Reports are herein integrated since the hazards mentioned are regional in scope and are common to the other reclamation projects adjacent to the Pasay Reclamation Project.

The Philippines as a whole and the project area in particular are often visited by typhoons. Although there are observed aberrations in typhoon behavior due to Climate Change, it remains a major geo hazard under Philippine setting.

Based on the meteorological data, Manila is exposed to an average of 5 typhoons in 3 years period vulnerable during the 2nd and 4th quarter of the year. The maps showing typhoon paths are shown in **Figure 4.15 page 4-32 to 4-37**.

Tsunami

Tsunamis, sometimes incorrectly referred to as tidal waves, are waves caused by rapid displacement of water by submarine earthquakes, volcanic eruptions or submarine landslides. These are high-energy waves commonly associated with earthquakes thus they are called seismic sea waves, or the Japanese term, "*tsunamis*". Tsunami is considered the most dangerous coastal hazard. The proposed project including its adjacent coastal areas could in theory be susceptible to this hazard due to the presence of an active subduction zone – Manila Trench located west of the area and other active faults and or earthquake generators. However, based on the MMEIRS, the Manila Trench which poses the greatest danger of tsunami to the coastal areas of Metro Manila will only generate an average wave height of 2-meters along Manila Bay.

The tsunami map of the Philippines is shown in **Figure 4.16 page 4-39**.

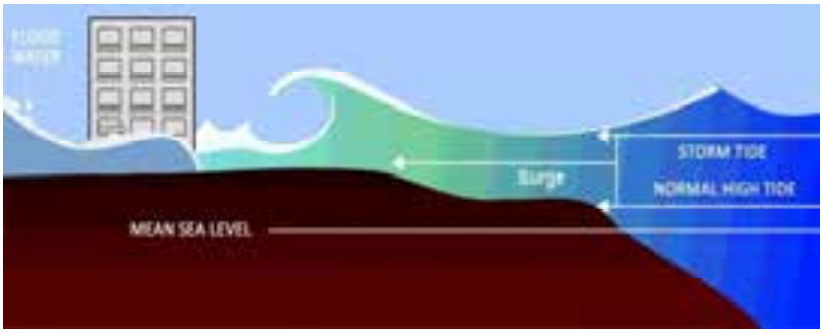
Sea Level Rises

The reclamation of portion of the Manila Bay will by itself not cause sea level rise.

Storm Surges

Storm surges could occur with or without the reclamation project. The reclaimed land, with a platform elevation of 3.5 meters and a length of 2,498 meters at the side facing the middle of the Bay, may even provide a sheltering effect could thence minimize floods in the coastal areas.

Moreover, wave deflectors similar to that currently installed in the reclaimed area will also be put in this proposed project. A typical wave deflector is shown in **Figure 4.14**.



In the illustration without a reclaimed land the surge reaches the shore while with a reclaimed land, shown below the surge is pushed back to the sea



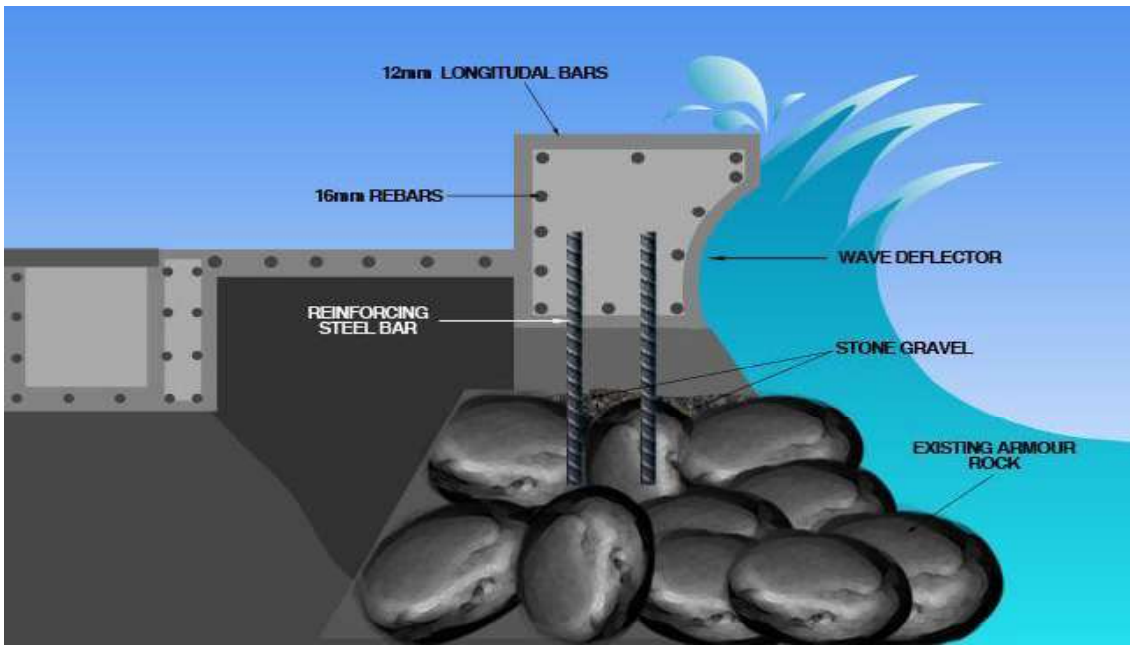


Figure 4.14 Illustration of a Wave Deflector Showing the Waves Bouncing Back to the Sea

Volcanic Activities

Entries made in other EIS Reports are herein integrated since the above hazards are regional in scope and are common to the other reclamation projects adjacent to the Pasay Reclamation Project.

The dangers posed by volcano are associated with eruption. Hazard from volcanic eruption depends upon the magnitude of its explosion. Hazards associated with volcanic eruptions include pyroclastic flows and base surges, lava flows, lahars and the ash or tephra fall. However, considering the distance of the project site to the nearest volcano which is Taal Volcano even the far-reaching ash fall/tephra fall hazard will not affect the proposed project.

Disturbance of Ground Water Resources

There will be no discharges of waste water to onshore that will result in ground water contamination.

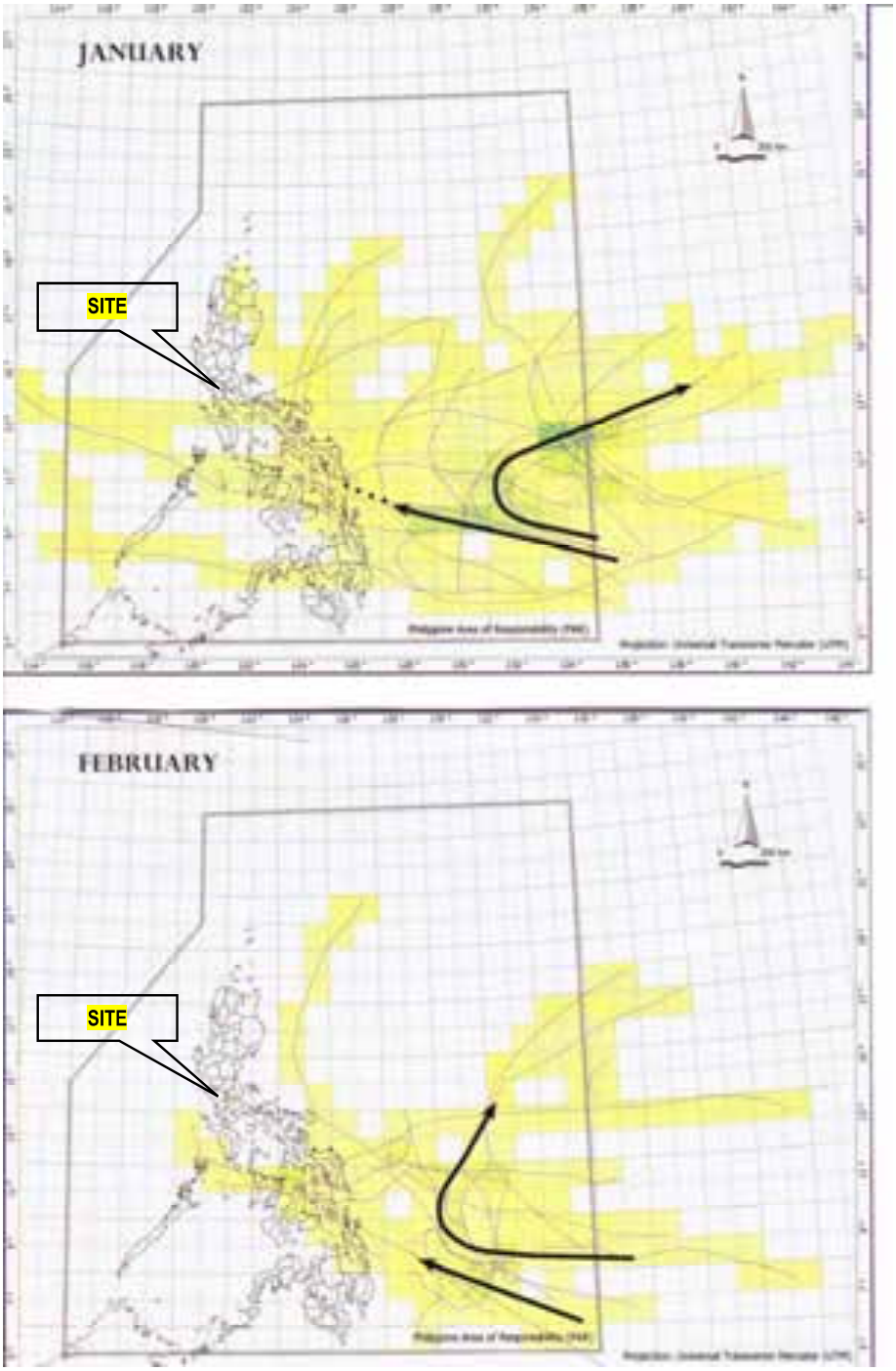


Figure 4.15 Typhoon Frequency and Pathway Maps

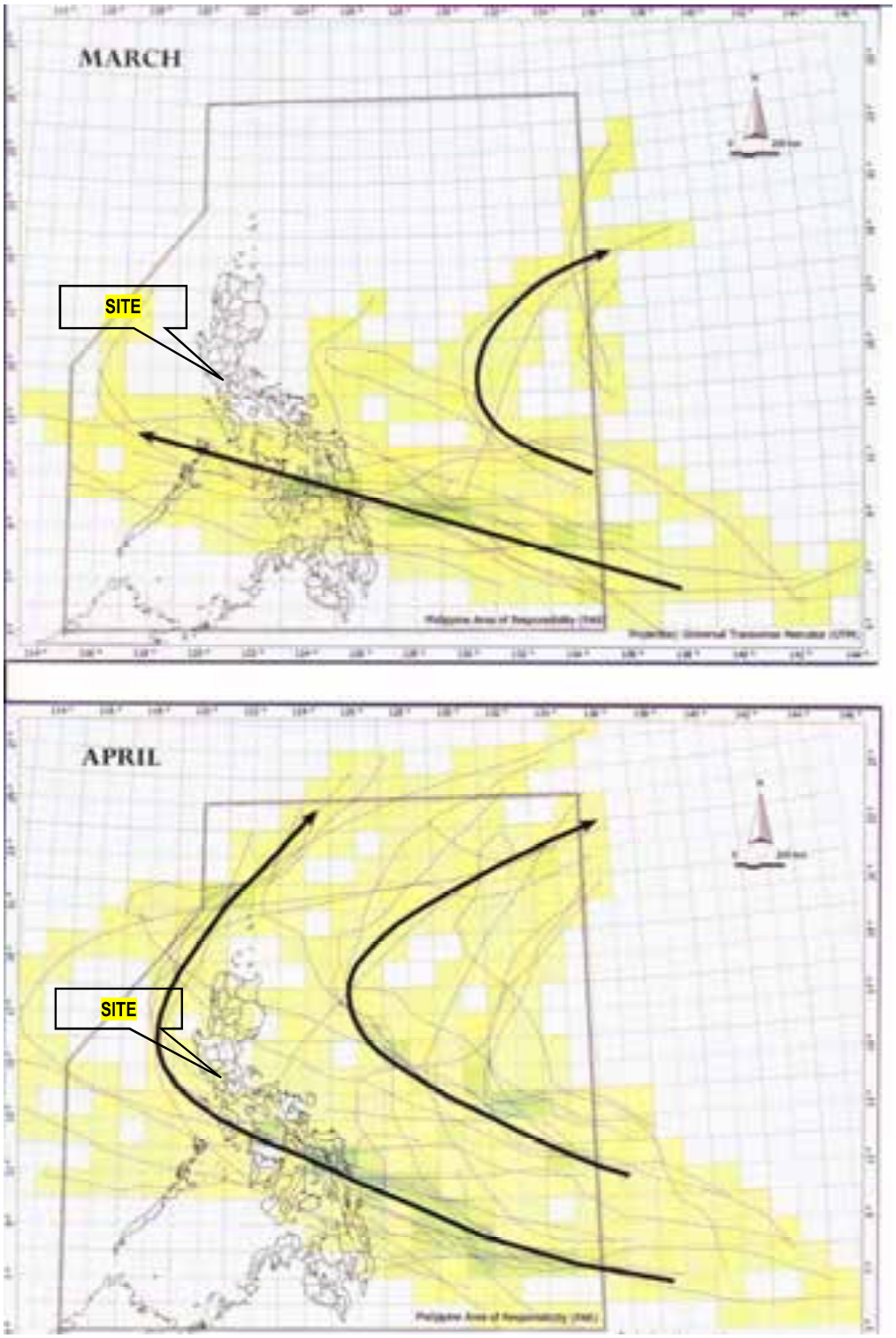


Figure 4.15 Typhoon Frequency and Pathway Maps

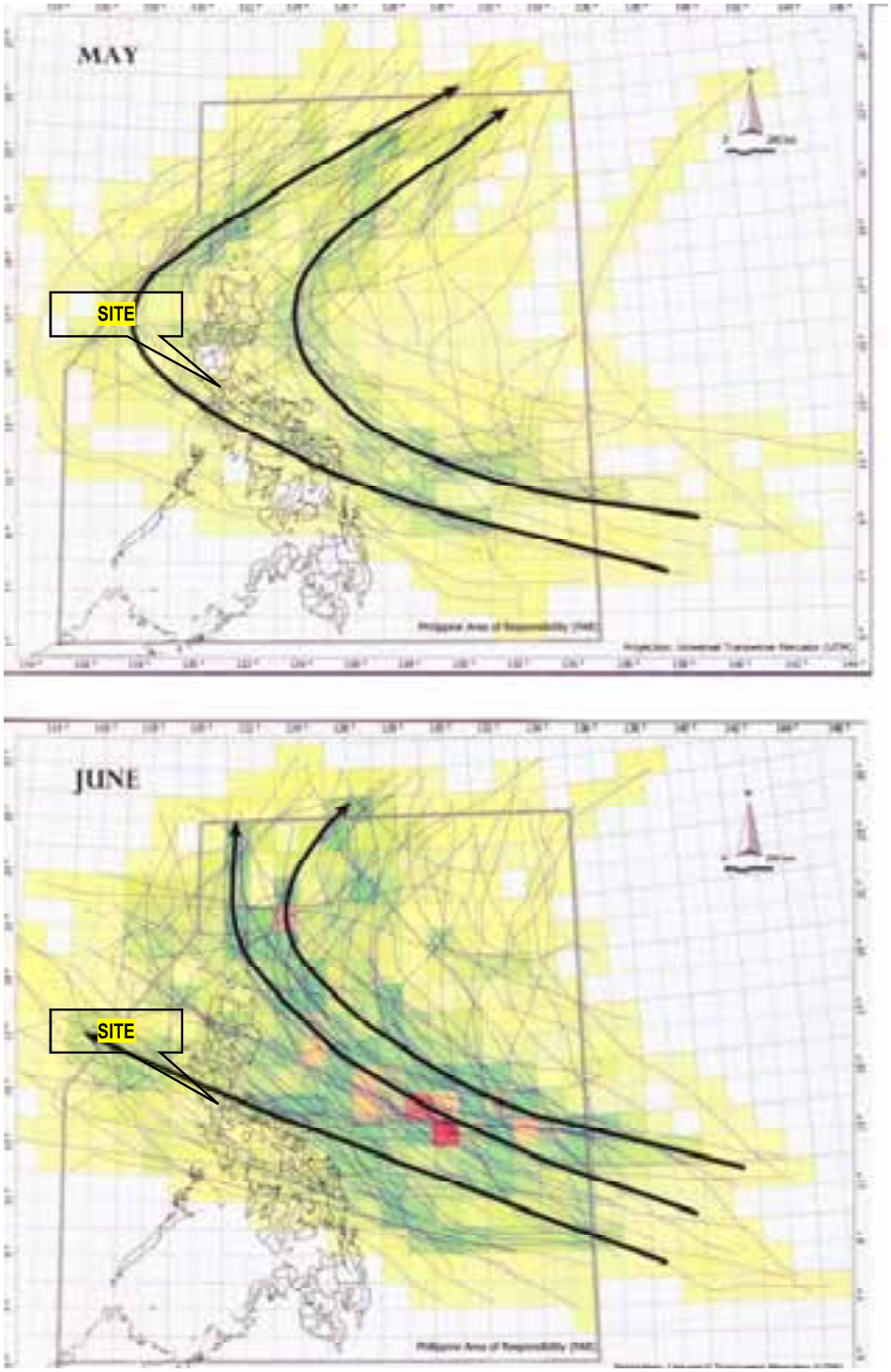


Figure 4.15 Typhoon Frequency and Pathway Maps

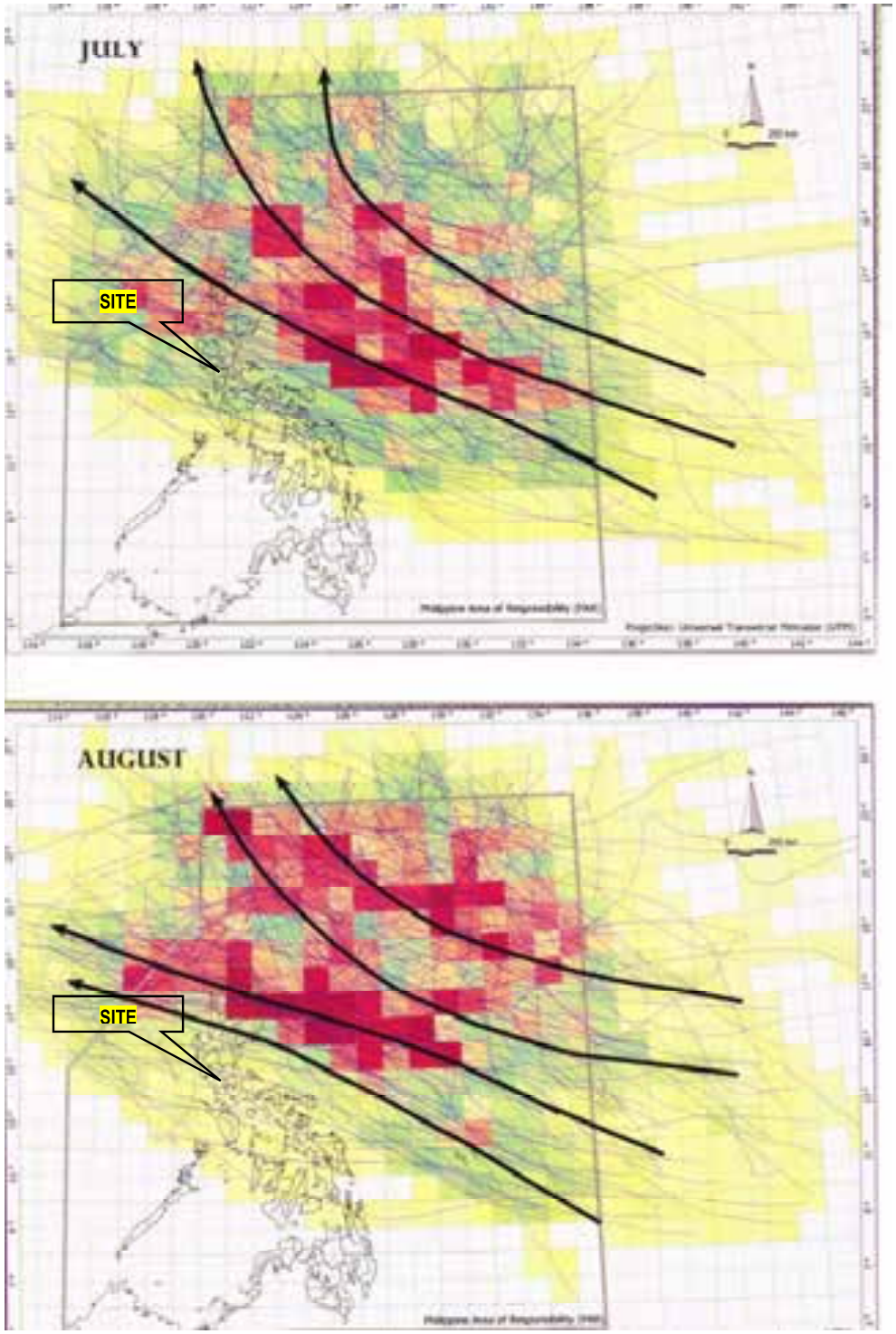


Figure 4.15 Typhoon Frequency and Pathway Maps

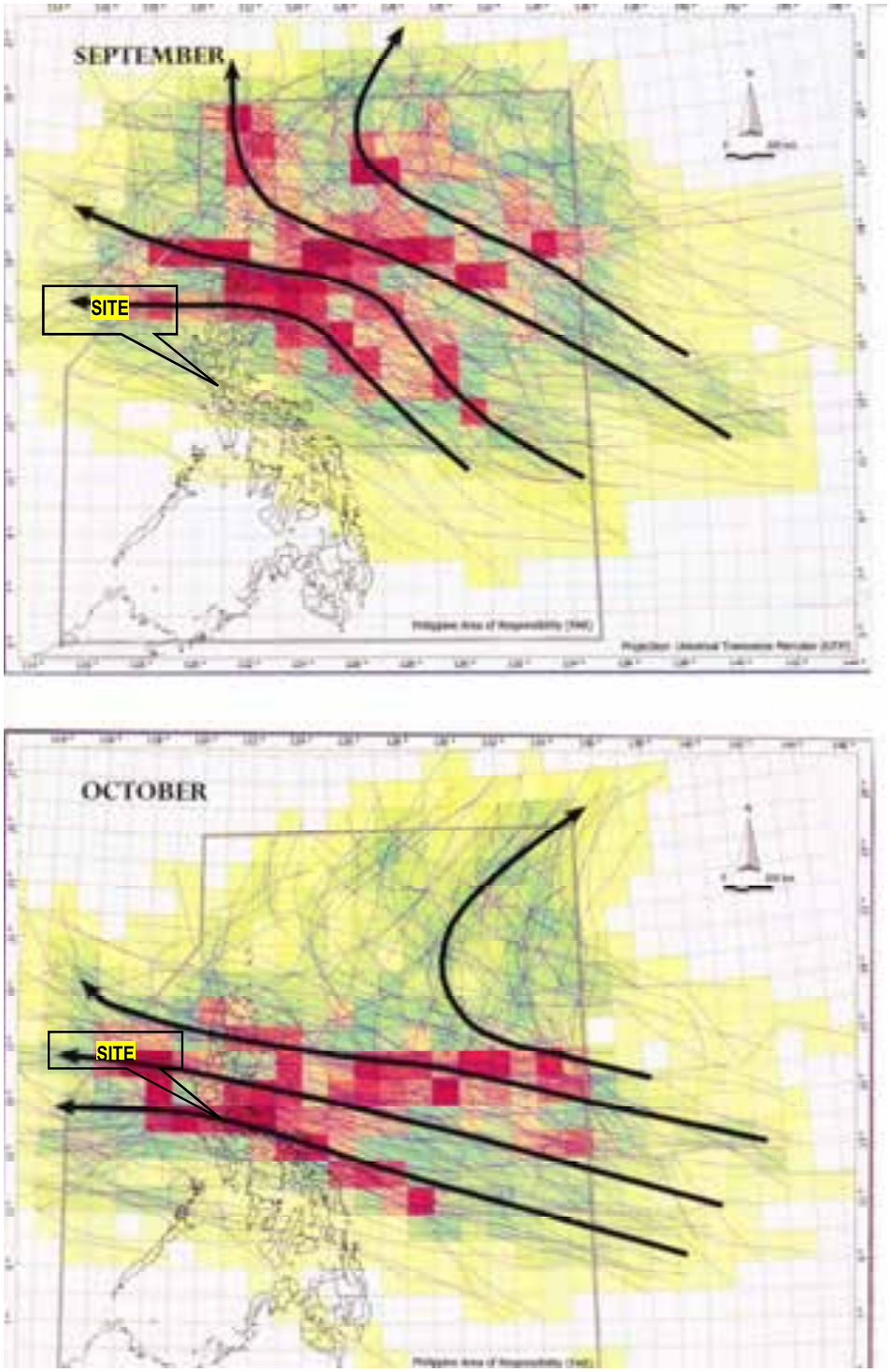


Figure 4.15 Typhoon Frequency and Pathway Maps

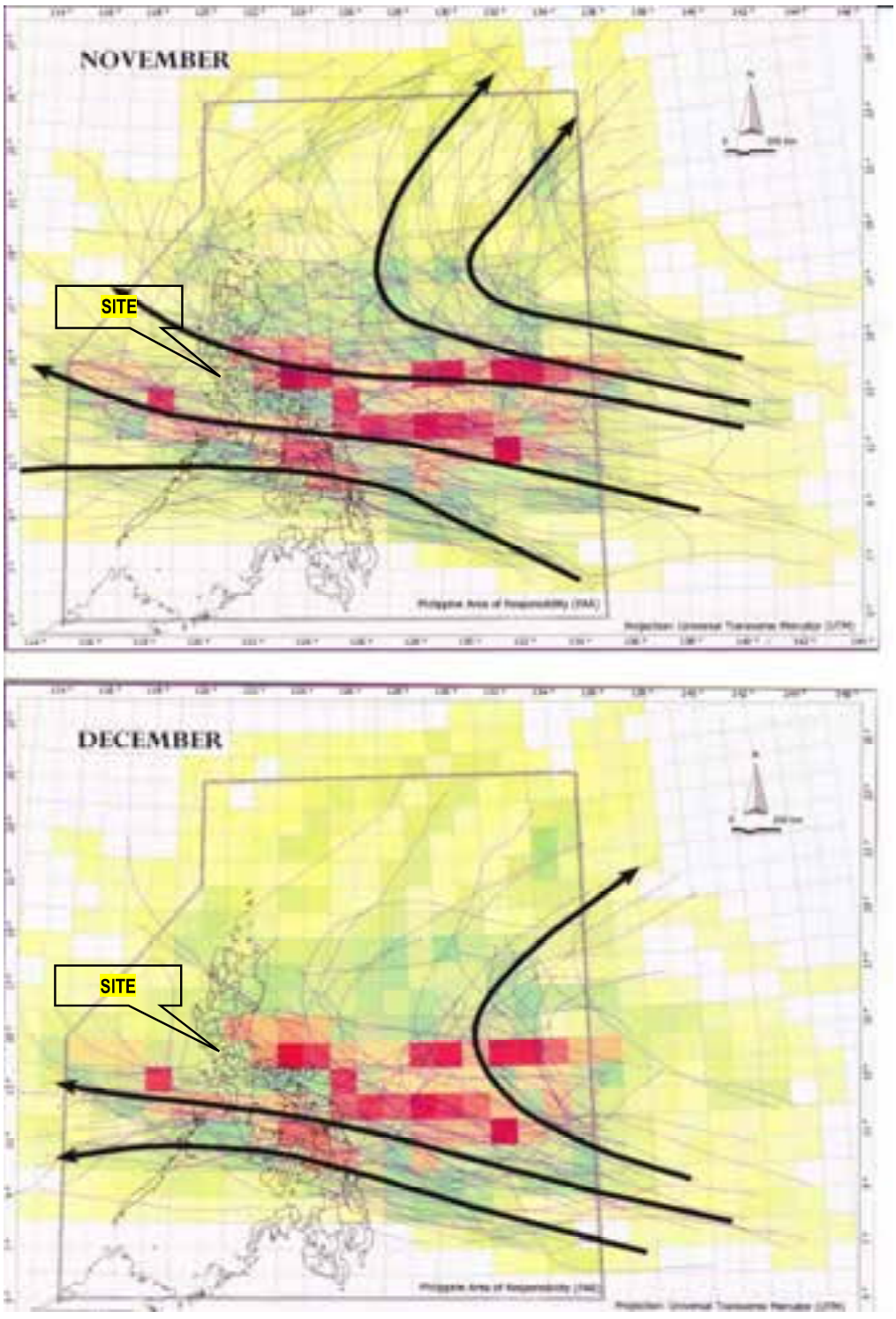


Figure 4.15 Typhoon Frequency and Pathway Maps

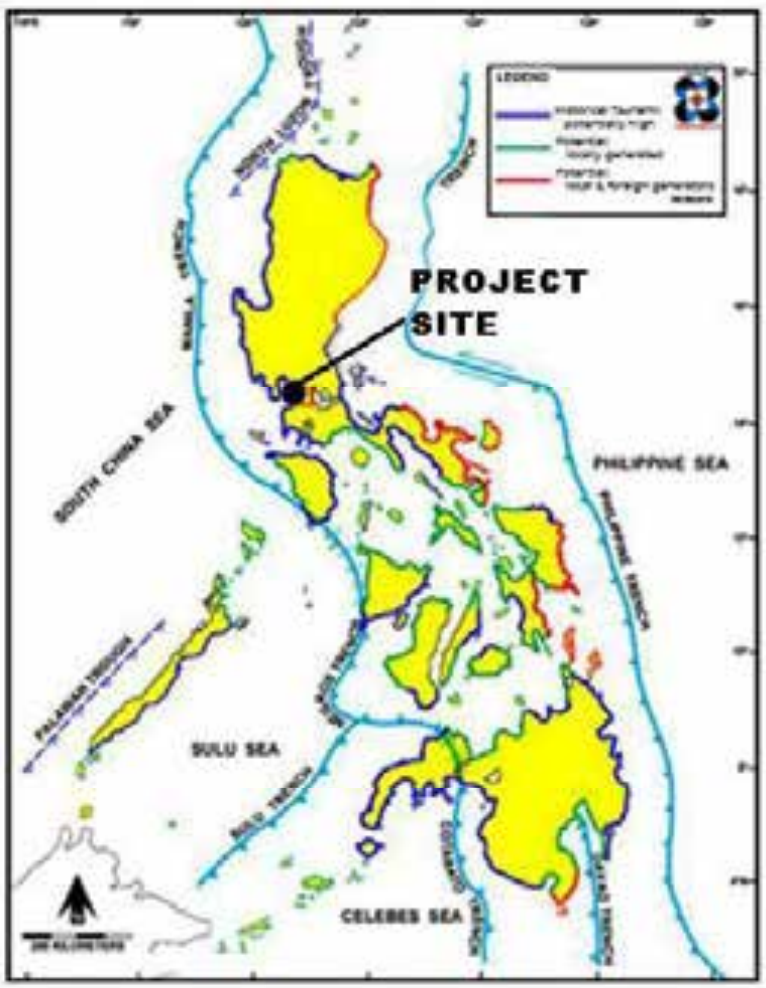


Figure 4.16 Map of Tsunami Prone Areas in the Philippines

According to the results of geohazard assessment, the Proposed 360 Reclamation Project is suitable for the intended purpose and development **provided appropriate and sound engineering intervention is observed and mitigating measures undertaken.**

The reclamation activities and the buildings/structures that would be constructed on the proposed project/reclamation site should conform to the various applicable codes of the Philippines.

Among the major geohazard concerns that must be properly addressed are the ground peak acceleration and the potential liquefaction.

The site is considered prone to liquefaction, differential settlement and settlement hazards, in order to mitigate these hazards, building and structures to be constructed must be founded on the solid bedrock and appropriate foundation design should be put in place to mitigate these hazards; the fill materials must be fully engineered and compacted to ensure stability.

The reclaimed land will necessarily be allowed to stabilized and tested for suitability to the construction of structures.

SECTION V. SOCIAL DEVELOPMENT PLAN FRAMEWORK (SDP) AND IEC FRAMEWORK

5.1 Social Development Plans (SDP)

Community development or livelihood programs/activities, projected beneficiaries, partner institutions, timeframe of implementation as well as source and amount allotted per activity/component (Per Annex 2-18 of RPM for DAO 2003-30)

In addition to the direct social/economic benefits derived from the project, e.g. livelihood and employment opportunities, taxes paid the city, etc. the proponent will be undertaking SDPs which includes but not limited to:

- Enhancement of the livelihood of legitimate and registered Pasay residents fisherfolks
- On the Job Training especially for the Youth
- Educational assistance e.g. skills training, continuing education, basic literacy and livelihood
- Medical Missions
- Environmental/Climate Mitigation Actions e.g.:
    - Tree planting
    - Programme for Carbon Sink
    - Climate Change Disaster Preparation

- Marine Pollution Prevention and Coastal Management and Clean - up consistent with the Continuing Mandamus on Manila Bay during the operations phase.

In fact, the above mentioned SDPs were stated by Honourable Mayor Calixto - Mayor of Pasay City, during the Public Hearing for the proposed reclamation project at Cuneta Astrodome, Pasay City last August 23, 2016. In particular, the following programs and projects are said to be undertaken through the proposed reclamation:

1. School and healthcare facilities and services
2. Medical, burial, educational assistance
3. Financial assistance to barangays and to victims of fire and other calamities
4. Balik-probinsya program
5. Social pension and senior citizen's welfare
6. Cash gifts and financial and emergency relief assistance
7. Medical missions and emergency relief programs
8. Livelihood programs and so on

More benefits for the city are perceived such as:

- Adopt ordinance: at least 50% of income from the reclaimed area for social services, livelihood & pro-poor programs
- At least 25% of income to environmental projects, including the clean-up of Manila Bay

The speech of Mayor Calixto is provided in **Annex 14.** On the other hand, the generic framework provided by DAO 03-30 is provided in **Table 5.1**, wherein may be seen:

- Candidate programmes/activities
- Responsible community members/beneficiaries
- Partner institution(s)

- Timeframe for implementation
- Source and amount of funds per activity

Responsibility for the SDP and IEC

The City of Pasay will be entering into a Consortium agreement with private sector developers for the implementation of the project. Thus the responsibility, including the funding for the SDC and IEC will fall on the Consortium.

Table 5.1 PRELIMINARY SOCIAL DEVELOPMENT (SDP) PLAN/FRAMEWORK

CONCERN	Responsible Community Member / Beneficiary	Government Agency/ Non-government Agency and Services (indicate specific services)	PROPONENT	Indicative Timeline	Source of fund
1. Livelihood / Employment (Men, Women, Youth & elderly) • On the Job Training especially for the Youth • Educational Assistance e.g. skills training, continuing education • Livelihood Projects/Enhancement, e.g. small-scale fishing; fisherman's wharf	Qualified Project Affected Men, Women, Youth & Elderly Registered and native residents of Pasay	• Barangay Council • Municipal Council • TESDA BFAR	Community Relations Officer	• Construction	LGU –IRA/ Proponent
2. Health and Safety	Barangay Kagawad for Health • Project-affected Community(ies)	• MHO • Barangay Disaster Management	Community Relations Officer	• Construction	Same
3. Education and Recreation	Barangay Kagawad for Education • Project-affected Families	• DepEd	Community Relations Officer	• Construction	Same
4. Environment and Sanitation • Environmental Actions • Tree planting • Marine Pollution Prevention and Coastal Clean - up • Climate Change and Disaster preparedness	Barangay Kagawad for Environment • Project Affected Community	• ENRO • MHO	Community Relations Officer	• Construction	Same
5. Peace and order	Barangay Kagawad for Peace and order • Project Affected Community	• LGU • PNP	Chief Security Officer	• Construction	Same

5.2 The IEC Framework

Target sector, key messages, scheme/strategy/methods, Information medium, timelines and frequency, cost (Annex 2-19 of RPM for DAO 2003-30)-

The IEC will be a continuing process through the operations phase of the project and has been initially undertaken.

IEC necessarily involves public consultations or Focus Group Discussions (FGDs). The generic IEC Plan/Framework is shown in **Table 5.2.**

The SDP and IEC herein given are generic in nature. This will be updated at the appropriate time when more information shall have been obtained on the details of the project implementation and when the Project Consortium shall have been organized. Consultations with the stakeholders will also be considered in the drafting of the final programmes.

The SDP and IEC frameworks herein discussed relate to the Reclamation/Construction Works (Phase 1); for the Operations Phase (Phase 2) these shall be established at the appropriate and later date when more details are determined for this phase.

5.2.1 Highlighting of the nature of the project.

The reclamation projects in Manila Bay along the coasts of the Cities of Pasay, Manila, Las Pinas and Paranaque have gained much attention in the media. Thus in highlighting the nature of the project, focus will be made on perceptions of the public/stakeholders on such issues as:

- **Flooding**
- **Liquefaction**
- **Land Subsidence**
- **Sea Level Rise**
- **Damage to the Marine Life**

These issues are discussed in several sections of this EIS.

5.2.2 Harmonization of the SDP/IEC with the Neighboring LGUs

Efforts will be exerted for the harmonization with the City of Manila and the City of Paranaque because of the common issues associated with reclamation projects and due to the close distance among the reclamation projects.

5.2.3 Consultation with the Professional Sectors, Individuals and Experts

During the detailed design and engineering works, the Proponent will undertake consultations as maybe necessary and feasible with independent professionals, individuals, members of the Academe, concerned governmental entities (e.g. the DOST PAGASA/PHIVOLCS) and of the Civil Societies concerning the application of technical/scientific/engineering knowledge and methodologies to address various perceived and real concerns on natural risks and hazards at the project site environs.

These perceived and real concerns relate to hazards/potentials on storm surges/waves, tsunamis, liquefaction and ground shaking.

The National Academy of Science and Technology (NAST) in fact conducted a scientific forum on February 15, 2016 in Manila on the topic:

Policy Discussion On The
Hazards, Risks and Profits of Reclamation

5.2.4 Timeframes

The reclamation phase is separate and distinct from the operations phase that involves the horizontal development. This phase may involve only between 4-5 years before turnover of the reclaimed land to the LGU. **Thus the timeframes for the SDP and IEC are necessarily tied into the project timetable.**

Table 5.2 Generic IEC Plan/Framework

Target Sector	Major Topic/s of concern in Relation to Project	IEC Scheme/ Strategy/ Method	Information Medium	Indicative Time/ Frequency	Indicative Cost
General Public • LGUs (Bgys to Municipality) • NGOs., • Church, • School • Fisherfolk • Barangay Leaders • Impact establishments such as Phil. Sofitel Hotel etc.,	• Nature of the Proposed Project • Impacts on environment and health ○ Floods ○ Liquefaction ○ Marine Ecology • Socio-Economic benefits • Socio-Economic impacts particularly to fisherfolks • Climate Change Mitigation • Climate Change Adaptation	Group Method Consultations ○ Send invitations to various stakeholders and impact sectors ○ Continuous discussion and consultation with the stakeholders to know their issues and concerns Public Consultation Social Development Program Local Printed Media	Focus Group Discussion / Power Point Presentation Printed Materials	Before construction Phase	To be determined
Professional society and individuals	Continuing consultation	Group Method	Focus Group Discussion Power Point Presentation	To be determined	To be determined
Prospective MMT Members (if formed) CENRO	Environment and Health	Group Method	Focus Group Discussion Power Point Presentation	Same	Same
MMT Members (if formed)	The Project EIA Water and Marine Ecology Quality Management	Group method Individual	Printed materials Focus Group Discussions	Same	To be determined

SECTION VI. ENVIRONMENTAL COMPLIANCE MONITORING

6.1 Self-Monitoring Plan

Provided in **Table 6.1** is the Environmental Monitoring Plan (EMoP) with Environmental Quality Performance Levels (EQPLs) consistent with Annex 2-20 of RPM for DAO 2003-30.

For this table the definition of EQPL-Environmental Quality Performance Level is as follows:

- Alert or Red Flag : early warning
- Action Level : point where management measures must be employed so as not to reach the regulated threshold or limit level, or to reduce deterioration of affected environmental component to pre-impact or optimum environmental quality
- Limit Level : regulated threshold of pollutant (standard that must not be exceeded); point where emergency response measures must be employed to reduce pollutants to lower than standard limit.

The EMoP and the EQPLs are necessarily applicable only to the reclamation phase of the project and the operations phase is thereby excluded.

Table 6.1 Summary of the ENVIRONMENTAL MONITORING PLAN (EMoP) with ENVIRONMENTAL QUALITY PERFORMANCE LEVELS (EQPLs) for the Reclamation Phase

Key Environmental Aspects per Project Phase	Potential Impacts Per Envit'l Sector	Parameter to be Monitored	Sampling & Measurement Plan			Lead Person	Annual Estimated Cost	EQPL MANAGEMENT SCHEME					
			Method	Frequency	Location			EQPL RANGE			MANAGEMENT MEASURE		
								ALERT	ACTION	LIMIT	ALERT	ACTION	LIMIT
I. PRE-CONSTRUCTION PHASE	**Not Applicable**												
II.CONSTRUCTION PHASE													
Environmental Aspect #1 Air	Ambient Air Quality	TSP	1 – Hour Gas Bubbler GriessSultzman High Volume Sampler / Gravimertic(USEPA method5)	Semi Annually	Downwind at nearest existing establishments or buildings	Project Manager	Php 100,000	Of minor significance because of absence of air pollution generators and because construction activities will be undertaken at sea and not at land.					
Environmental Aspect #1 Air	Ambient Air Quality	Noise	Meter	Daily	Same as above	Project Manager	Nil	Of minor significance because of absence of air pollution generators and because construction activities will be undertaken at sea and not at land.					
Environmental Aspect #2 Land	Terrestrial	Considered as Nil or not significant. There are no Terrestrial (Floral) resources.											
	Solid Wastes	Not relevant. Activities will be on sea. Solid wastes during construction or dredging will consist of unwanted sea bed materials which will be disposed at an area within the Manila Bay or on shore Activities on land will be during the stabilization of the reclaimed land and will not involve major work except settling and compaction of the reclaimed land											
Environmental Aspect #3 Water	Water Quality Bay Pollution	BOD_5	Azide Modification-Dilution Technique (USEPA method 3010)	Quarterly	Downstream of specific site of reclamation activities	Project Manager	Php 7000	Not considered relevant because domestic wastes are from construction crews only who are based on barges or sea going vessels					
	Water Quality Bay Pollution	Total Suspended Solids (TSS)	Gravimetric (Dried at 103-105° C) (USEPA method 3010)	Quarterly	Downstream of specific site of reclamation activities	Project Manager	Php 2000	90 % of the prescribed limit	95 % of prescribed limit	At least 100 % prescribed limit	Inspection of activities	Corrective Actions, e.g. silt traps	Temporary stoppage until corrections made
	Water Quality Bay Pollution	Color	(USEPA method 3010)	Quarterly	Downstream of specific site of reclamation activities	Project Manager	Php 1000	Not considered significant, no color modifying substances to be discharged					
	Water Quality Bay Pollution	Temperature	Thermometer(USEPA method 3010)	Quarterly	Downstream of specific site of reclamation activities	Project Manager	Nil	Not considered significant, no thermal effects					
	Water Quality Bay Pollution	pH	pH probe (USEPA method 3010)	Quarterly	Downstream of specific site of reclamation activities	Project Manager	Nil	Not considered significant, no acid or bases in effluents					

Key Environmental Aspects per Project Phase	Potential Impacts Per Envit'l Sector	Parameter to be Monitored	Sampling & Measurement Plan			Lead Person	Annual Estimated Cost	EQPL MANAGEMENT SCHEME					
								EQPL RANGE			MANAGEMENT MEASURE		
			Method	Frequency	Location			ALERT	ACTION	LIMIT	ALERT	ACTION	LIMIT
	Water Quality Bay Pollution	O & G	Std Method	During reclamation works	At strategic points	Project Manager		90 % of prescribed limit	95 % of prescribed limit	At least 100 % of prescribed limit	Inspection of activities for corrective actions	Corrective Actions	Temporary Stoppage
	Water Quality Bay Pollution	Arsenic	SDDC, Spectrophotometric	During reclamation works	At strategic points	Project Manager	Included in the Php 50.000 estimated annual budget for heavy metals parameters	90 % of prescribed limit	95 % of prescribed limit	At least 100 % of prescribed limit	Same as above	Same as above	Same as above
	Water Quality Bay Pollution	Chromium	Flame AAS	During reclamation works	At strategic points	Project Manager	Included in the Php 50.000 estimated annual budget for heavy metals parameters	90 % of prescribed limit	95 % of prescribed limit	At least 100 % of prescribed limit	Inspection of activities for corrective actions	Corrective Actions	Temporary Stoppage
	Water Quality Bay Pollution	Lead	Flame AAS	During reclamation works	At strategic points	Project Manager	Included in the Php 50.000 estimated annual budget for heavy metals parameters	90 % of prescribed limit	95 % of prescribed limit	At least 100 % of prescribed limit	Inspection of activities for corrective actions	Corrective Actions	Temporary Stoppage
	Water Quality Bay Pollution	Mercury	Manual Cold Vapor AAS	During reclamation works	At strategic points	Project Manager	Included in the Php 50.000 estimated annual budget for heavy metals parameters	90 % of prescribed limit	95 % of prescribed limit	At least 100 % of prescribed limit	Inspection of activities for corrective actions Corrective Actions		Temporary Stoppage
	Water Quality Bay Pollution	Marine species	Underwater survey	During reclamation works	Near the site where construction activities, e.g. dredging or filling are conducted	Project Manager	Php 200,000	10 % decrease from the baseline	20 % decrease from the baseline	50 % decrease from the baseline	Inspection of activities Check and monitor the performance of dredging works	Corrective Actions Increase frequency of inspection and monitoring	Temporary Stoppage until corrective measures in place

Key Environmental Aspects per Project Phase	Potential Impacts Per Envit'l Sector	Parameter to be Monitored	Sampling & Measurement Plan			Lead Person	Annual Estimated Cost	EQPL MANAGEMENT SCHEME					
			Method	Frequency	Location			EQPL RANGE			MANAGEMENT MEASURE		
								ALERT	ACTION	LIMIT	ALERT	ACTION	LIMIT
Environmental Aspect # 4 People	Jobs	Employment of local qualified residents	Record of contractors	Entire reclamation period	N.A.	Project Manager	Part of the operation cost	Negative feedback to the Proponent	Formal complaint by the hired workers		Proponent to investigate	Bring Notice of DOLE	Review the operation protocol and reconsider the complain if applicable
	Jobs	Payment of compensation workers	Payment records	Same	N.A.	Proponent	Part of the operation cost	Negative feedback to the Proponent	Formal complaint by the hired workers		Payment of Salaries within the month	Review the operation protocol and reconsider the complain if applicable	Bring Notice of DOLE

The Operation Phase is not applicable because the project only involves horizontal development and that is the Reclamation Project.

The operations phase will be subject to separate and relevant laws governing the PEISS.

6.2 The Multi-Partite Monitoring Team

Provided in Annex 3-4 of the RPM for DAO 2003-30 is the specified scope, responsibilities and activities of the MMT.

- Monitor project compliance with the conditions stipulated in the ECC and the EMP in the EIS.
- Validate proponent's conduct of self-monitoring.
- Receive complaints, gather relevant information to facilitate determination of validity of complaints or concerns about the project and timely transmit to the proponent and EMB recommended measures to address the complaint.
- Prepare, integrate & disseminate simplified monitoring reports to community stakeholders.
- Make regular and timely submission of MMT Report based on the EMB-prescribed format.

The list of stakeholder members of the MMT, the basis of selection and proposed role is given in the **Table 6.2**.

Table 6.2 List of MMT Stakeholders/Basis of Selection /Proposed Roles

Stakeholder Member	Basis of Selection	Proposed Roles
EMB NCR	Per Annex 3.4 of RPM	• Ensure adherence to policies and IRR of the MMT body • When necessary refer items in conflict to EMB CO for resolution
Project Proponent (City of Pasay)	Same as above Main Responsible entity Host City	• Provide funds • Provide relevant project information • Allow MMT inspection of site and of pollution abatement facilities • Participate in monitoring • Assist and sign MMT Report • Provide MMT with related City Policies
Host Barangay (District 76)	Same as Above	• Participate in monitoring • Assist and sign MMT Report
NGO or PO registered and accredited in the City of Pasay	Most vulnerable group(s) Must be accredited in the City	• Assist in monitoring • Assist in MMT report • Provide relevant inputs on the sector represented
Philippine Reclamation Authority	Authority for all reclamation projects	• Ensure compliance with the internal guidelines of the PRA • Ensure compliance with Agreements with PRA
Department of Tourism	Tourism enhancement	• Ensure project aligned to Tourism • Policy and Objectives
Philippine Coast Guard	In charge of Philippine Coasts	• Ensure compliance with rules of PCG relative to marine environment
Manila Bay Council	Policy Making for Manila Bay	• Ensure harmony with the MBC policies

Some entries made above are similar to other reclamation projects adjacent to the Pasay Reclamation Project and already granted ECCs.

6.3 Proposed Amount of the EGF

1. **Proposed EGF trust fund-** Php 2.5 M
2. **Proposed EGF cash fund-** Php 1.0 M fund will be discussed with the MMT upon its formation.

Basis of the estimate

Annex 3-6 of the Revised Procedural Manual provides the guidelines for the determination of the EGF and is summarized hereunder with the more relevant provisions written in boldface.

There is no explicit provision under DAO 2003-30 requiring valuation of potential impacts that may arise as a result of changes in the use of natural and environmental resources. In some large scale projects however (such as power projects), estimation of the value of environmental impacts is already included in the EIA costs and benefits. **Impact valuation is particularly crucial in estimating the EGF** to derive estimates on the potential damage that may occur, and the corresponding amount to be set aside through the EGF for such purpose.

Procedures for arriving at such estimates in a more rational and systematic manner will have to be based on experiences that shall have been generated on Philippine examples and other developing countries.

In the absence of such information, more recent experiences of projects of similar nature with provisions for EGF may be utilized. **The amount to be allocated for the EGF shall be determined through negotiations between the proponent and the EMB (EMB-CO or EMB-RO).** It should take into consideration the following factors in determining the appropriate amount for specific projects:

- The EIS committed programs
- **The degree of environmental risk involved (based on number and extent of potential damage)**
- Valuation of resources that would most likely to be affected
- The proponent's ability to provide funds for the EGF

At the end of the project life, a sufficient amount should be left from the EGF to ensure that rehabilitation, restoration, decommissioning, or abandonment shall be adequately financed. Such amount may be increased during the project life span to insure that the balance shall be sufficient for the abandonment phase. In such case, the EGF Committee may require an adjustment of such amount to cover inflation and other factors. **The required submission to the DENR-EMB of the project's Abandonment Plan shall have a corresponding fund commitment subject to the approval of the DENR or the lead government agency with direct approving authority on the Abandonment/Decommissioning Plan of the project.**

Risks or Emergency Situations Arising from the Project

The degree of environmental risk involved and impact evaluation cited in the above guidelines of the RPM are discussed in **Sections 3.3** and **3.4** from which the following conclusions are culled.

There are insignificant societal risks since:

- The project involves only Phase 1, the Reclamation Phase
- At worst situations the scenario for Societal Risk is not reached
- The site is at sea wherein there are no population exposed to the reclamation works
- The risks, if any, are confined to the construction crew only.

There are no identified significant risks directly identifiable with the project or at the impact areas with respect to:

- Fire
- Explosion
- Release of toxic substances
- Oil spills

The reclamation activities involve:

- Dredging
- Filling
- Sea transport of the dredging vessel
- Stabilization of the reclaimed land.

The major potential risks involve primarily accidents which are normal in any construction activities. The dredging vessel is relatively most vulnerable to risks which may potentially arise from:

- Oil Spills
- Collisions with other vessels or with fish pens/cages along the navigational lane

Sufficient funds and insurance coverage will be imposed on the various contractors for the project so that unforeseen emergency events arising from their activities (not of the Project Proponent) shall be assured of insurance and other form of funds. One of the major requirements in prequalifying potential bidders is financial capability. To be included in this requirement is that in an event although unlike of collision of the sea vessel with others, the responsibility shall fall under the Contractor.

EGF at end of Project Life

This will be covered by the entity to take legal responsibility for the Phase 2 of the project, i.e. starting from vertical constructions to operations of the locators in the reclaimed land.

SECTION VII. EMERGENCY RESPONSE POLICY AND GENERIC GUIDELINES

7.1 Consistency of the safety policy and generic guidelines with the regulatory requirements. Emergency Preparedness should also consider natural hazards to the infrastructures and facilities.

The safety and emergency response policy is necessarily responsive to the nature of the risks and hazards during the reclamation phase. A time frame of approximately 2-3 years is involved which represent the period by which dredging and filling operations will be undertaken, i.e. exclusive of the soil stabilization timeline during which there are no expected risks and hazards.

Generally, there are no societal risks involved since the reclamation/dredging and associated works are to be undertaken in non-populated area, i.e. at the sea.

No chemicals, flammable materials or hazardous substances are used in significant quantities for the project. Diesel oil will be used for pumps and engines in the dredging vessels and other equipment.

Water craft/sea going dredging vessels will be used to dredge for and carry filling materials from source to project site. Barges will transport rocks from onshore. Sailing of these vessels would as in any other case involving sea crafts bring about the natural risk of collision. However the sailing of these vessels will take a short distance as in the case of the San Nicholas Shoal in Cavite located at only approximately 25 kilometers from project site.

The key facilities/safety devices needed to respond to emergencies are as follows:

a. **Fire fighting equipment on board the dredging barge**

   Fire fighting equipment complying with international standards, e.g. CO2 or chemical fire extinguishers will be installed in the barges.

b. **First aid kit for treatment of injuries due to accidents**

   First aid medicines and accessories will be made available for use in case of injuries to the construction crews or to third parties in case of collision.

c. **Communication system**

   Effective communication system, e.g. radio and mobile telephone are vital safety-related devices to keep the barge crew and construction workers at sea updated on any emergencies such as typhoons and tsunamis.

d. **Personnel Protection Equipment** e.g. safety helmets, boots, eye goggles, ear mufflers and others,

Provided in **Table 7.1** is the summary matrix of potential risks and emergency situations of the proposed project.

Table 7.1 Summary Matrix of Potential Risks and Emergency Situations

Activities	Potential Risks	Vulnerable Parties/ Affected Resources	Safety Devices/Facilities
Sailing of Dredging Vessel Transport of rocks-carrying barges	Collision with Other Vessels	Vessel crew and dredging operators	Communication Facilities First Aid Equipment Navigational Equipment Personnel Protection Equipment
	Accidental Oil Spills from Fuel of Vessel	Marine Ecology	Oil Spill Boom
	Damage to fish/molluscs pens in the navigational lane	Fish/molluscs pen owners	Communication facilities Navigational equipment
Operation of various equipment	Accidents	Construction crew	Communication Facilities First Aid Equipment
Other types of activities	Natural disasters, earthquakes, tsunamis, etc.	Construction crew	Communication Facilities Personnel Protected Equipment

Entries made above are similar to other reclamation projects adjacent to the Pasay Reclamation Project.

From the above table the following may be noted in respect of emergency response and safety policy:

- The relevant activities and people involved thereat are those involved in the reclamation works (Construction Phase) only and not during the Operations Phase. The latter involves the construction and occupancy of buildings and structures.

- There are no societal risks since the vulnerable persons to risks/hazards are the construction workers.

7.2 Consistency of the safety policy and generic guidelines with the regulatory requirements.

The Philippine Coast Guard (PCG) is the primary agency mandated with regulating sea craft movements.

Oil Spill Risk

Oil spill risk may be posed by the dredging vessel carrying oil as fuel for its engines. The proponent will secure approval of its project an Oil Spill Contingency Plan (OSCP) from the Philippine Coast Guard (PCG) before project implementation, and ensure that the vessels the project will use will secure government permits for transport, storage, dumping and disposal of any material to and from the project.

The Oil Spill Contingency Plan (Summary)

Introductory Notes

In defining the responsibility area for major accidents such as oil spills, the following steps are first established which identify the appropriate oil spill response. From the relevant response, the responsibility area is established.

The Project Proponent will spell out in the contract with the dredging contractor the specific responsibilities of the contractor with regard to environmental risks and commitments/compliances with the ECC conditions.

Illustrated in **Figure 7.1** are the guidelines for determining appropriate oil spill responses.

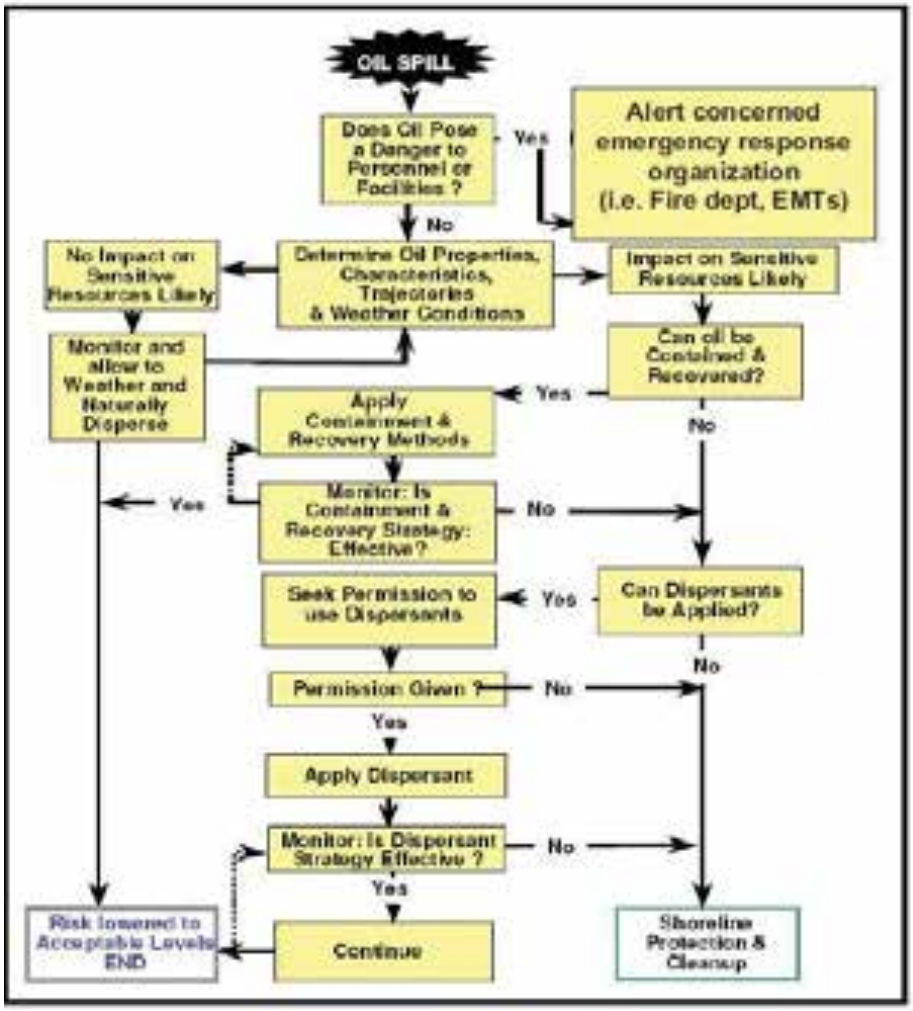


Figure 7.1 Guidelines in Determining Appropriate Oil Spill Response

The Manila Bay Oil Spill Contingency Response Plan (MBOSCP) Organization Oil Spill Incident Control Management Team (OSICMT)

(Reference: Manila Bay Oil Spill Contingency Plan, November 23 2008. A "GEF/UNDP/IMO Programme on Partnerships in Environmental Management for Seas of East Asia. In Cooperation with the Philippine Coast Guard and the Department of Environment and Natural Resources)

During an oil response the On-Scene Commander shall have control of all oil spill response operations supported by an *Oil Spill Incident Control Management Team* (OSICMT) composed of the following.

Member of this team are selected from the identified support agencies of the following:

- Operations Manager
- Planning Manager
- Logistics Manager, and
- Finance and Administration Manager

Functions of the *Oil Spill Incident Control Management Team* (OSICMT)

- ***Commander, Coast Guard District National Capital Region- Central Luzon -CGD-NCR-GL (CCGD-NCR-CL)***
    - Over-all command & control of the crisis situation.
    - Apprise the Commandant PCG of the crisis situation.
    - Recommend of the *Commandant, Philippine Coast Guard* (CPCG) the release of the appropriate *Philippine Coast Guard* (PCG) funds to support the operation.

- ***Commander, Marine Environmental Protection Command -MEPCOM (CMEPCOM) /***
- ***Director National Operations Center for Oil Pollution -NOCOP***

  In the event that the spills shall escalate to a tier three spill, the CPCG through MEPCOM/Director NOCOP shall assume all responsibilities of the Commander, CGD NCR-CL.

    - Evaluate reports;
    - Designate alert conditions
    - Advise the CCGD-NCR-CL on appropriate course of action in combating the spill;
    - Dispatch available resources;
    - When necessary, call out the supporting elements;
    - Recommend to CMEPCOM the suspension or termination of any operation;
    - Liaise with the spiller of his insurer;
    - Make recommendations to the port authorities regarding port closure or traffic limitations in affected area;
    - Prepare press releases;
    - Prepare other public information material;
    - Perform other tasks as directed by *Commandant, Philippine Coast Guard* (CPCG).

- ***On-Scene Commander***

  The On-Scene Commander shall be the Station Commander of CGS Manila.

    - Evaluate spill or potential spill reports;
    - Designate the severity of the spill;
    - Activate response team and conducts containment, recovery and clean-up operations;
    - Sends *Pollution Reports* (POLREP) to *National Operations Center for Oil Pollution* (NOCOP)
    - Ensure that communication facilities are manned at all times and maintain communication with personnel in charge of assisting response team, support elements and the NOCOP;
    - Coordinates all activities at the scene;
    - In the event of inclement weather, recommends suspension of the operation to NOCOP;
    - Recommend termination of any operation
    - Submit post-operation report.

- ***Operations Manager***

  The Operations Manager shall be the Operations Officer of *Coast Guard District National Capital Region- Central Luzon* (CGD NCR-CL) and shall deploy the *Marine Environmental Protection Unit* (MEPU) NCR-CL to augment manpower and provide technical skills in oil spill response operation. He shall be responsible for the conduct of the following:

    - water operation

- shoreline protection
- shoreline clean up
- air operation
- special operations
- Prepare reports based on received information
- Convey information within and/or outside the center.

The Operations Manager shall be assisted by a team composed of personnel from the following agencies/entities:

a.) Spiller
b.) *Philippines Navy* (PN)
c.) *Local Government Units* (LGUs) concerned
d.) *Department of Environment and Natural Resources – Protected Areas and Wildlife Bureau* (DENR-PAWB) (NCR, R-3 & R-4 PAWCZMS)
e.) *Bureau of Fisheries and Aquatic Resources* (BFAR) (NCR/Region 3,4)
f.) *Philippine National Police* (PNP)- *Maritime Group* (Manila Bay area)
g.) *Department of Health* (DOH) of affected area
h.) BFP of affected area

Tiered Response to Oil Contingencies

Under this concept which is accepted internationally, the nature and organizational set up for a response id primarily dependent on the size of an oil spill and the distance from a response center.

Tier	Amount	Response
1	Up to 10 m^3	Company or Ship Response Organization / District Response Organization
2	Up to 1000 m^3	First Tier Response plus National Response Organization
3	> 1000 m^3	The total national resources, with the addition of foreign resources

Spilled Volume of not more than 10 cubic meters

The ship's in house organization shall be responsible for taking the necessary action. However if the Ship lacks the needed facilities the responsibility is taken over by the District Response Organization in the person of the Officer in Charge of the 1st Marine Environmental Protection Unit of the Coast Guard. In any event coordination and reporting to the PCG will be made.

Fire fighting equipment complying with international standards, e.g. CO_2 or chemical fire extinguishers will be installed in the barge/sea vessels.

Foam fire extinguishers falling under the standards A and B Class due to the nature of fires should not only be readily available but inspected regularly by competent authorities.

Foam fire extinguishers are marked with a Blue colour code and should be clearly distinguished with other types of fire extinguishers.

Water is not used for petroleum oil fire fighting but is applied only in areas near the fire for cooling purposes.

First Tier Response (Spilled volume of up to 1,000 cubic meters)

For this case the First Tier Response set up applies and in addition the National Response Organization also gets involved The National Operations Center for Oil Pollution (NOCOP) of the Philippine Coast Guard is the primary/lead unit of National Response Organization.

For Spilled Volume of at least 1,000,000 cubic meters

- **Accidental Oil Leaks/Spills**

Oil spill booms will be kept ready for use in an event of accidental oil spills. In such an event, the spilled oil will be recovered by pumping from the sea water, stored in tanks/drums for disposal on shore to third party accredited Disposal facilities. Another method of oil recovery is by absorption by appropriate oil-absorbent materials and thereafter recovery of the oil-soaked materials and disposal on shore through an accredited 3rd party entity.

For illustration purposes only shown below is a picture of a typical containment boom in a reel.

Plate 7.1 Photograph of a typical of containment boom in a reel



7.3 Integration/harmonization of the proposed mitigation plans for the Project with that of the existing LGU contingency/emergency plans for these hazards.

Strictly, the Project involved is confined only to Phase 1 which covers the reclamation activities through the creation of a stabilized reclaimed land. There will be no major above-ground structures during this Phase and population will still be absent. Moreover, inasmuch as the City of Pasay is itself member of the Project Consortium, integration and harmonization will be readily undertaken.

Nevertheless generic contingency/emergency plans are herein presented in the summary, **Table 7.2.**

In this table the contingency/emergency plans for the Project refer to measures relevant to the people and structures in the 360-hectare reclaimed area during the Operations Phase while the plans for the LGU refer to those for the on-shore people, facilities and structures.

Table 7.2 Generic Contingency/Emergency Plans

Disaster Scenario	Contingency/Emergency Plans for Project	Contingency/Emergency Plans for the LGU	Remarks
Storm Surge	The platform elevation provides protection Building heights also give protection Evacuation may not be necessary Building design to consider storm surges	Evacuation centers away from the shoreline Early warning system in coordination with NDRMC and DOST/MMDA Coordination with MMDA, DPWH, PNP, DOH	The Yolanda scenario not likely for the Project Site
Liquefaction	Sound design of structures/buildings Reclamation land itself sound Evacuation in remote/unlikely scenario Out gress well designed Close coordination with PhiVolcs	Impacts on shore independent and not related to Project Reclamation Project may in fact serve as evacuation center Close coordination with PhiVolcs	On-going construction and long standing buildings good testimonies, typical shown below 
Earthquakes	Sound design for reclaimed land itself and buildings/structures May itself serve as evacuation center for people on shore	Evacuation centers Close coordination with PhiVolcs, MMDA, DPWH, PNP and the Fire Department	See also above (liquefaction) and Note 1
Floods	The reclamation area being at sea and separated from land by a buffer channel and at elevated platform will not flood. Drainage system will allow discharge of flood water to sea.	Evacuation centers which may include the reclamation site itself Close coordination with PhiVolcs, MMDA, DPWH, PNP Early warning system in coordination with NDRMC and	The flood path of the disastrous Typhoon Ondoy is not along the project site and vicinity

Disaster Scenario	Contingency/Emergency Plans for Project	Contingency/Emergency Plans for the LGU	Remarks
		DOST	
Tsunamis	The platform elevation provides a protection against tsunamis In remote case of sea water flooding the site evacuation of population at the site can be to the elevated buildings	The contingency/emergency plan for the adjoining communities is independent as that for the project. Close coordination with PhiVolcs, MMDA, DPWH, PNP Early warning system in coordination with NDRMC and DOST	

Note 1.

A PHIVOLCS study on the Marikina Valley Fault system located in eastern Metro Manila noted that the fault line is evident starting from Bagong Silangan in Quezon City and extending towards the south. The fault passes through Loyola Grand Villa Subdivision in Quezon City proceeding southward to Barangay Barangka, Marikina City and assumed to proceed southwards down to Valle Verde Subdivision in Pasig City. The study roughly estimated that large magnitude earthquakes from magnitude 6 to 7 at least along the northern portion of the Marikina Valley Fault.

The Vulnerable areas identified in the MMEIRS study listed below do not include the project site and its vicinity

> Spring Country Subdivision, Filinvest 2, Filinvest 1,Batasan Hills, Alabang Heights, Barangay Tumana, Barangay Pansol, La Vista, Loyola Grand Villas, Loyola Heights, Miriam College, Ateneo, Barangay Barangka, Barangay Industrial Valley Complex, Blueridge A, Eastwood Mall, White Plains, Green Meadows, St. Ignatius, Acropolis, Medical City, Valle Verde Villages, Tiendesitas, University of Life Pasig, St. Paul Pasig, Barangay Kapitolyo, Department of Education, URC Plant, Barangay Oranbo, Barangay Bagong Ilog, East Rembo, Bgy. Comembo, International School, Market Market Mall, Serrendra, Bgy. Pembo, Bgy. Rizal, Mckinley Heights, Cypress Towers, North Signal Village, Tribeca Private Residences, Buli, Asya Enclaves, Alabang Hills, Muntinlupa City Proper, Tunasan, Susana Heights, Southwoods, De La Salle Canlubang and Stone Crest."

7.4 Disaster risk reduction and climate change adaptation policies and guidelines

During the short term of the project which may last through 3-5 years including the period of soil stabilization, the major climate change-related emergency scenario is flooding. The major activity involving the Trailer Suction Hopper Dredger (TSHD) must stop until normalization of the conditions. The personnel are housed in the vessel and are relatively safe from disasters.

No societal risks are involved especially with the temporary cessation of all dredging/reclamation works.

Sea level rise is considered one of the key climate change phenomenon. However, this will not be experienced in significant levels during the next five (3) years.

7.5 The proponent's final safety/contingency/emergency guidelines (based on safety assessment eg. HAZOP) must be submitted to EMB prior to operation

Compliance with this requirement will be made.

SECTION VIII. ABANDONMENT/DECOMMISSIONING/REHABILITATION POLICY

8.1 Statement on Proponent's policies and generic procedures for Rehabilitation/ Decommissioning/Abandonment will be submitted post-ECC, within a timeframe specified in the ECC.

8.2 General Abandonment/Decommissioning Scenario

Following are the general scenario in an event although remote of permanent or long-term project abandonment, reclamation phase.

a. **Stoppage of all construction, dredging, reclamation, filling and associated works.**

   No further works will be involved.

b. **Site assessment and rehabilitation**

   As a matter of good practice, although no toxic and hazardous substances are used, a site assessment of the reclaimed land shall be made.

   If necessary rehabilitation of the site will be made.

c. **Alternate plan for the abandoned/decommissioned reclaimed land**

   It will be incumbent on the City of Pasay to decide on best plan for the use of the abandoned/decommissioned reclaimed land.

SECTION IX. INSTITUTIONAL PLAN FOR EMP IMPLEMENTATION

9.1 Discussion of the organizational scheme of the proponent including line of command and reporting procedures as well as manpower complement and relationships with other operating departments, contractors and management of other linked projects.

Following key points are noted in respect of the organizational scheme:

A consortium will be organized which will be responsible among others for the implementation of the project. The members of the consortium are expected to be:

- The City of Pasay
- The Philippine Reclamation Authority/National Development Authority and
- A private sector project developer

The private sector member of this consortium is expected to take responsibility for the reclamation phase in accordance with the agreements that will be made among the members of the consortium.

The Project Developer will be awarding the reclamation/dredging works to qualified contractor(s). The manpower complement of the contractors will be determined by the Contractors themselves. The line of command will be directly from the Project Developer through its Project Manager to the Contractor through the latter's Construction Manager.

Figure 9.1 is an illustration of the Institutional Plan that may likely be adopted by the Project Consortium.

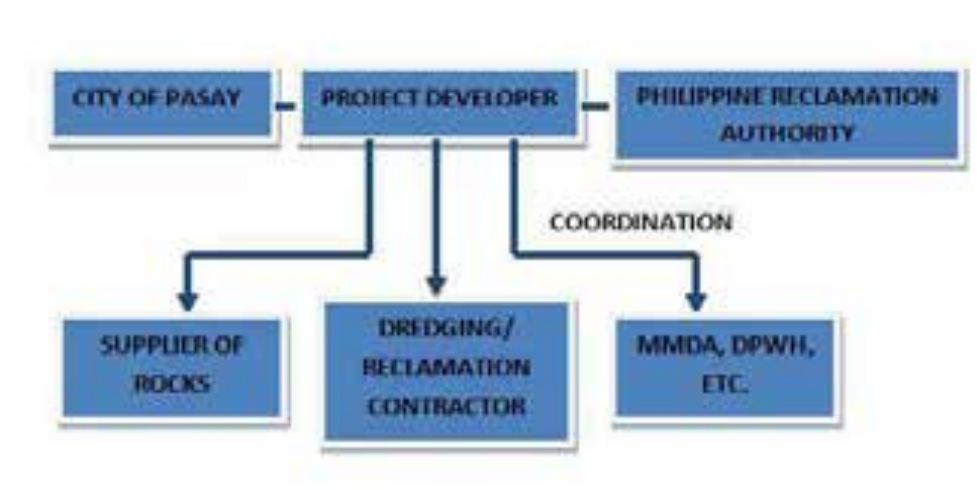


Figure 9.1 Institutional Plan for Project Implementation

Organizational Unit for the Dredging and Reclamation Works

Dredging and reclamation are the centers of construction activities. The crew involved is based at the Dredging Vessel and is a self contained unit. Approximately 48-50 personnel are involved in this operation.

Figure 9.2 is a generic institutional plan for the dredging and reclamation unit.

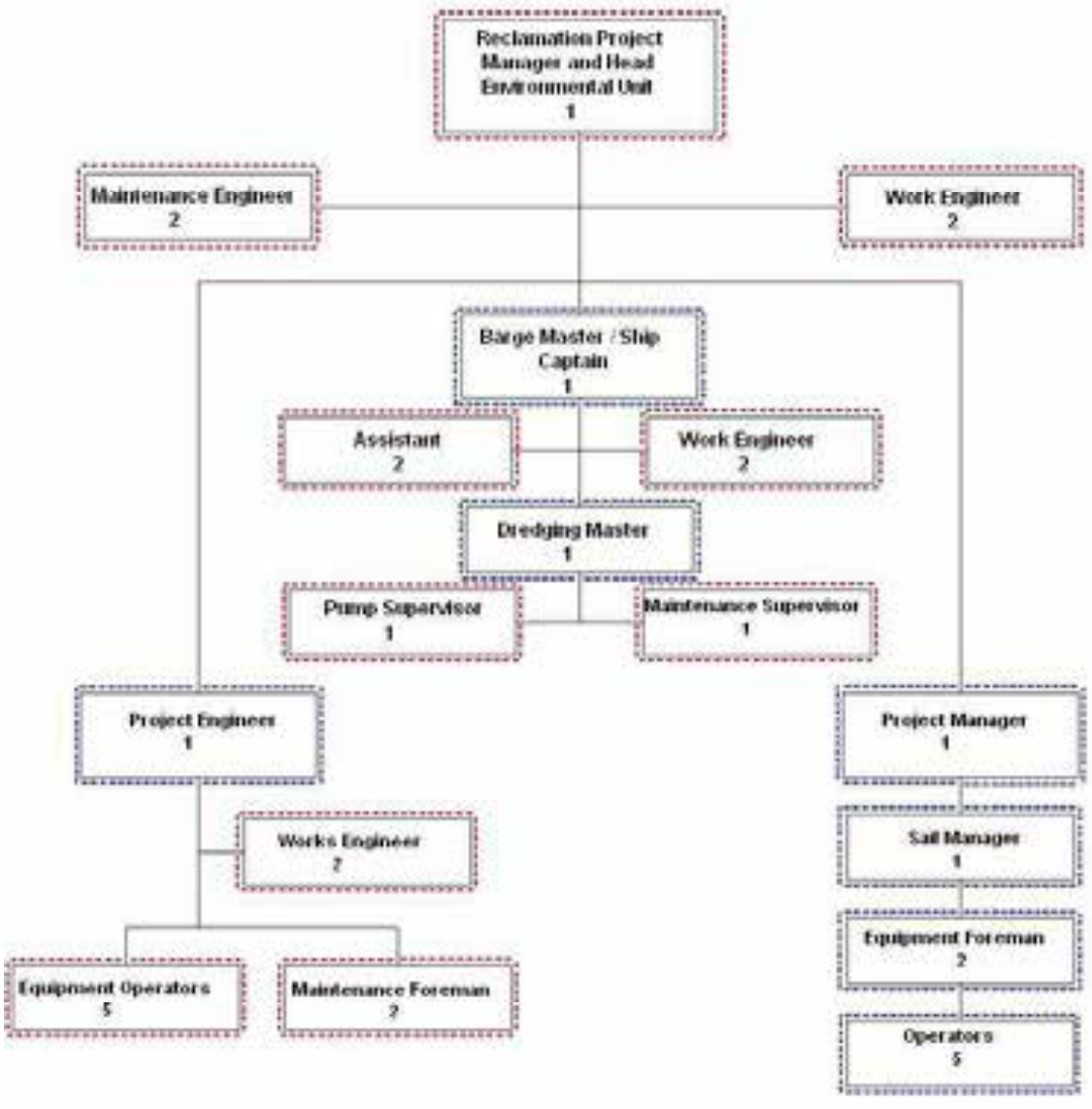


Figure 9.2 A Generic Institutional Plan for the Dredging and Reclamation Unit

9.2 The shared responsibilities and liabilities of linked projects and other relevant entities

At this point of time although there are known project under planning involving reclamation in Manila Bay only one (1) project has an Environmental Compliance Certificate (ECC) but apparently Is constrained by the Courts from implementing the project.

There is therefore no organized initiative yet for sharing responsibilities and liabilities of the linked projects although this idea has certain merits.

The common and relevant entities to the sharing of responsibilities and liabilities are, among others:

- **The Philippine Reclamation Authority**

  Being the government agency with overall mandate over reclamation projects

- **The Metropolitan Manila Development Authority**

  For its involvement in addressing common problems such as floods and traffic congestion.

- **The Department of Works and Highways**

  For its involvement in providing infrastructure support to the various projects

- **The Philippine Coast Guard**

  For its stewardship of the Philippine marine waters

SECTION III. IMPACTS MANAGEMENT PLAN (IMP)

Having discussed the project components and relevant baselines in the previous sections and noting the issues as well as perceptions raised during the Public Scoping and Public Hearing and those identified in the perception surveys and Focus Group Discussions, the major impacts and corresponding impact management plan are herein presented. "Perceptions" (used loosely to mean belief or opinion in contrast to the term "impacts" which connotes most likely events) by certain stakeholders are nevertheless included in the discussions. *(In view of the importance of this Section some of the relevant entries already made in other Sections are repeated herein instead of being simply referred to)*

It is significant to note that the Impacts and Impact Management Plan (as well as the EMoP) concerns the first phase of the project which is the reclamation phase and the subject of an application for an Environmental Compliance Certificate (ECC). References are however made to the operations phase, i.e. the activities following the completion of the reclamation for purposes of presenting a holistic view of the project.

3.0 Pre-Construction Phase

During this phase the major activities to be undertaken are:

- Securing of permits, e.g. The Notice to Proceed from the Philippine Reclamation Authority (PRA).
- Clearances from other government entities.
- Environmental Compliance Certificate (ECC)

There will be no activities at the project site except for some survey works such as bathymetric studies, marine survey studies, geotechnical survey, etc. and similar other investigations which do not have impacts on the environment.

3.1 Construction Phase (Reclamation Works)

Construction phase includes:

- **Reclamation and associated works until the reclaimed land is fully stabilized.**

The estimated time to attain the desired full stabilization of the reclaimed land may take one (1) to two (2) years. This depends partially on the contractor's reclamation methodology to be employed which would take into account, among others, the results of the final soil/sea bed geotechnical investigation, the quality of the fill materials.

3.1.1 Perceptions of Flooding

The reclamation project will not contribute to or aggravate the existing flooding problems in the City of Pasay and in the immediate environs of the project site. It is a general public knowledge that the flood in the city and in Metropolitan Manila are basically caused by clogged drainage systems which is largely attributable to the irresponsible dumping of household garbage, particularly of plastic wastes and other such non-biodegradable materials. The drainage system of the city which includes the Estero Tripa de Gallina pumping systems and the adjacent channel in Maricaban has been largely compromised with the intrusion of informal settlers. Also, an estimate by Metro Manila Development Authority (MMDA) is that the city dumps daily 3,000 cubic meters (equivalent to 600 trucks) of garbage and other solid materials in rivers, drains and waterways. With respect to the project, the proposed reclamation will not exacerbate the floods being experienced for the following reasons (discussed in details in **Section 2.2.2**).

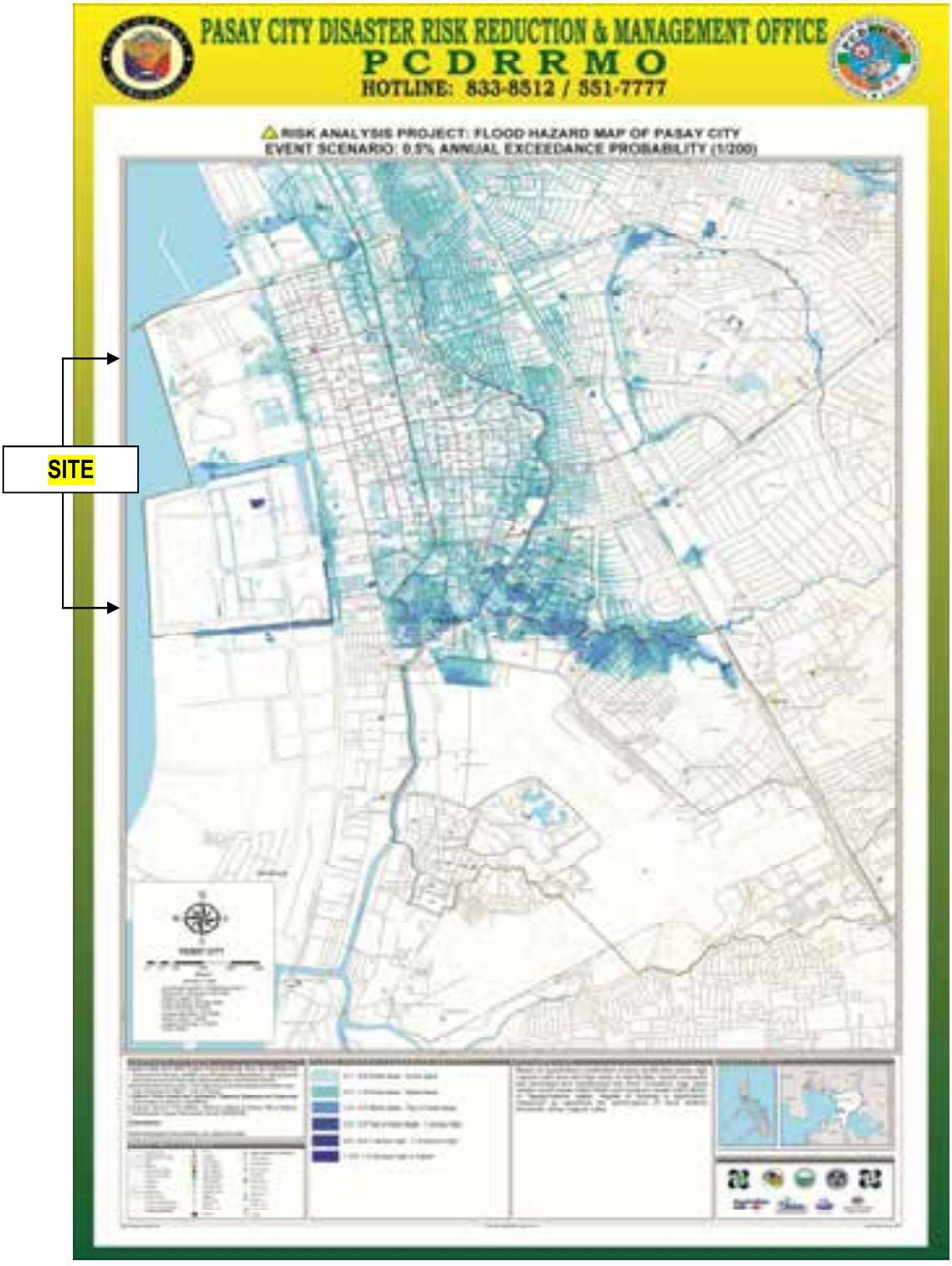


Figure 3.1 Flood Hazard Map of Pasay City: Event Scenario 0.5% Annual Exceedance Probability (1/200)

The project will not disturb or clog the existing drainage system since the drainage system is not in the alignment of the project.

The Libertad Channel will likewise not be affected despite its mouth being perpendicular to the southern end of the 300-hectare reclamation. There is provided a circulation channel at the mouth of the Libertad Channel with much greater area than Libertad Channel itself.

On the contrary, the reclaimed land can in fact provide a sheltering effect on storm surges. Storm surges is said to be considered as one of the causes of coastal flooding. The walls of the reclamation boundaries facing the sea, the platform elevation of 4.0 m above MLWW and the installation of wave deflectors (illustrated in **Figure 3.2**) would tend to block the storm surges and/or reduce/dissipate their energy forces.

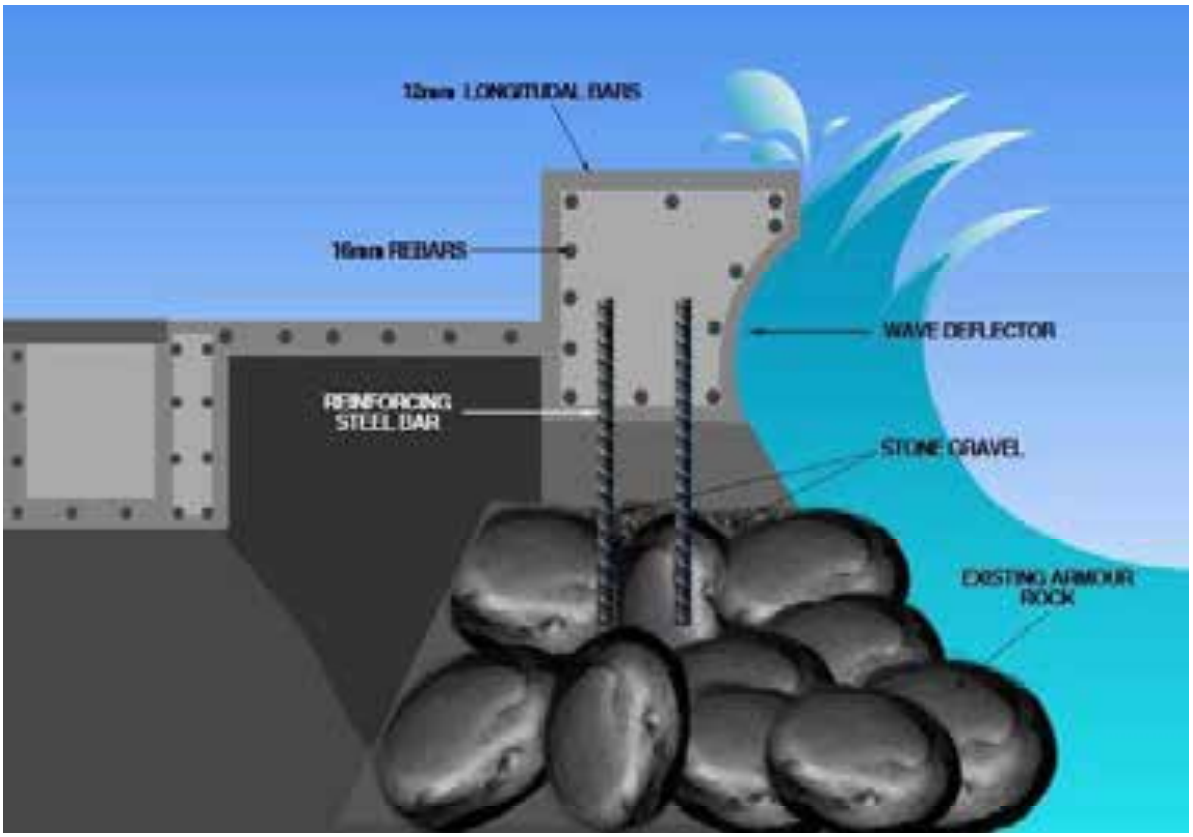


Figure 3.2 An Illustration of the Wave Deflector

Flood Mitigation/Control Projects in Metro Manila

Moreover the local and national government have already started to implement flood mitigation projects for Metro Manila which include among others.

- Major Flood Control Projects Including those in the Laguna Lake Region where the flood waters to the City of Manila emanate.
- Cleanup of the Esteros.
- Dredging projects.
- Various multi-sectoral initiatives for the better management of the disposal of garbage which clogs the drainage systems.

3.1.2 Perception of Impacts on Land Subsidence

The subsidence of lands in Metro Manila has been observed and backed by scientific evidences. Among the serious impacts of land subsidence is flooding in the low areas which experience subsidence.

However, the cause of subsidence is groundwater extraction. With regards to the proposed project, the project will not extract ground water directly or indirectly, the sources of its minimal water requirements during the reclamation phase are either from the MWSS system and/or from purchased water for drinking purposes and domestic purposes.

For both the storm surge and land subsidence scenarios these hazards/effects will be experienced even in a "*No Project"* Scenario.

In a *"With Project Scenario"* concerns could arise is that the sea wall provided by the reclaimed land will tend to divert storm surges to coastal areas outside of the project site or Pasay. The point(s) of diversion will depend on several variables i.e. direction of the storm surge flow, extent of dissipation of the storm surge energy, length of the reclamation walls, etc.

3.1.3 Impairment of the Important Marine Life

The detailed marine surveys of the impact areas (**Section 2.2.2**) revealed the following results:

Baseline surveys and environmental impact assessment in the proposed reclamation site were conducted by a team of fisheries and marine biologists on 13-14 August 2014 and November 2012. The assessment was focused on determining existence and subsequently, defining ecological attributes of three principal coastal resources, i.e., (i) coral reefs, (ii) seagrass, and (iii) reef-associated fish communities. Mangroves are absent in the proposed project site and in contiguous adjacent coastlines. Moreover, Interviews were conducted with key informants who declared that no coral reefs exist in the project area and fisheries resources are not significant. In spite of these preliminary findings, the survey team still proceeded to verify and investigate a large swath of the coastal environment within the proposed reclamation site itself, with the objective of validating the alleged absence of significant benthic life forms in the area. A stretch of coastal waters more than 3.2 kilometers long was then subjected to intensive manta tow surveys, bottom substrate verification through spot dives and systematic snorkeling appraisal in shallow portions where underwater inspection through scuba cannot be employed.

Manta tow surveys and spot dives were employed to verify the presence or absence of benthic communities where coral life forms, macro-invertebrate communities, fish populations, algae and epiphytes in the bottom substrate. Conducted broadly, the manta tow survey is designed to generate a good estimation of habitat types and distribution over large impact areas and over longer stretches of coastal waters. In areas where significant coral reefs occur, results from a manta tow survey is used to pinpoint the location of specific stations where more detailed scientific underwater coral characterization employing line intercept transects will be undertaken.

For the 2014 survey, a total of forty-four (44) manta tow observation stations were conducted within the proposed reclamation site. Observations from manta tow pathways covered a breadth of approximately 10 to 20 meters of coastal waters in the shallow portion of the sea in the proposed reclamation site and stretched to about 3.2 kilometers towards the Paranaque area. This was supplemented by three (3) spot dives inside and outside of the proposed the site, three (3) stations where actual fishing was conducted to verify presence of fish species, 5 plankton community survey stations, five stations for meio-benthos investigation and random surveys for the presence of macro-invertebrates in rocky portions of the breakwater lining the SM Mall of Asia perimeter.

Species composition, abundance and density of phytoplankton and zooplankton communities were determined using plankton net vertically lowered and towed from sub-surface depths.

Shannon-Weaver Diversity/Evenness Indices and bio-assessment metrics are then derived from the results of the sampling. Identification of phytoplankton species that can enrich to become harmful algal blooms that can potentially cause paralytic shellfish poisoning was also undertaken. In Manila Bay, algal blooms are periodic occurrences due to the incessant hyper-nutrient loading from domestic wastewater. Sampling stations were strategically chosen so that the stations are evenly distributed throughout the length of the proposed reclamation site. Five (5) plankton sampling stations were employed during the survey. An assessment of meio-benthos, soft-bottom organisms that are good indicators of pollution, was also undertaken in the same stations.

Even as it appears that the area is devoid of significant stocks of finfish due to turbid and predominantly poorly-oxygenated waters, rapid fisheries appraisal was undertaken through key informant interviews to determine (i) dominant fishing gears used in the study area, (ii) dominant catch composition, and (iii) estimated catch rates. The fisheries investigation was supplemented by actual fishing operations using a 500-meter bottom set gill net in three (3) stations.

Salinity measurements were also undertaken in the three actual fishing stations using a standard Atago refractometer.

Manta tow assessments in forty-four pathways (**Figure 2.2.62** and **Table 2.2.5**), supplemented by systematic snorkeling in strategic points around the proposed reclamation site, and three spot dives (**Figure 2.2.63**) revealed the complete absence of any significant benthic community of corals, seagrass communities, natural or man-made fish shelters or artificial reefs, as well as occurrence of macro-invertebrates and macro-algae in all the stations surveyed. In all forty-four stations, silt and muddy substrate were observed (**Figure 2.2.62**)

The benthic substrate of the area is comprised of mud, silt and sandy substrate mixed with fragments of broken shellfish carapace and bits of debris. The seabed is essentially barren and ecological functions are completely unremarkable, exacerbated by largely eutrophic conditions brought about by decaying sediments and extensive blankets of silt. Visibility was acutely turbid. The absence of fisheries, including set traps and stationary weirs, also indicate that is very little competing interests on a resource base that is ecologically impaired and cannot support stable existence of marine organisms.

The muddy substrate, polluted water and turbid conditions are construed to have a significant negative impact on photosynthetic activity and marine food production, causing low dissolved oxygen content and highly unsuitable substrate for colonization or settling of benthic invertebrates, demersal species of fish, corals and seagrass recruits. It is not surprising therefore that the manta tow and spot dives did not encounter any biotic community of fundamental ecological value. The overwhelming silt and sediment load has also completely prevented the growth of seagrass and associated benthic macro-algae. Algal aggregates were found in unimpressive distribution only in the rocky seawall of the mall. Validation through spot dives in areas suspected to have firmer substrate only further confirmed that seagrass resources were completely absent in the study area. Moreover, no macro-invertebrates were observed during the spot dives and snorkeling near the shoreline

Essentially the same results were obtained during the first survey undertaken for the 60-hectare site, on November 2012.

A confirming survey was undertaken on August 19, 2016 which further validated the absence of significant fishing activities in the project site (Discussed in **Section 2.2 pages 2.2-116 to 2.2-120**)

Nevertheless mitigating measures to be observed include the following:

a. **Phased Construction Schedule.**

The entire 360-hectare project area will be reclaimed in phases, thus limiting impacts at a given time to the particular work area only.

b. **Use of Containment Structures/Silt Curtains**

Relative to the above (Phased Construction Schedule) containment structures will be installed which will serve as curtains/barriers to prevent dispersal of silt and dredged materials. The dredging activity will naturally result in sea bed disturbance and thus of silt generation.

c. **Dredging Methodology/Dredging Contractor**

The selection of the prospective dredging contractor will be judiciously made. This will include among others experience, dredging methodology, equipment to be used and other aspects for mitigation of potential impacts on the Manila Bay. The experiences with previous reclamation works in Manila Bay will be used as guidelines and reference for the future other similar projects.

d. **Prevention or mitigation of potential impairment of the quality of the Manila Bay water.**

This would be undertaken by:

- Preventing discharges of oil leaks from the dredging vessels and in case of accidental leak the immediate containment, recovery and disposal of the same.

- Installing own toilet facilities at the dredging vessels and discharging the wastes to approved facilities, i.e. not to the Manila Bay.

3.1.4 Loss of Portion of Manila Bay

The Manila Bay has an approximate volume of water body of **13 cu.km.** while the estimated volume of the reclamation is 0.036 cu.km., resulting in an ***apparent*** loss of a portion of Manila Bay due to the Proposed Project at a minimal **0.027%.**

The relatively insignificant loss of water body will be compensated by the creation of water body in the portion of Manila Bay (San Nicholas Shoal in Cavite) which will be dredged for the purpose of sourcing fill materials. This compensation is the reason the loss is termed “apparent”.

3.1.5 Sea Level Rise As a Result of the Project

Globally, sea level rise is brought about by climate change. Since the mid-19th century, sea level has been rising, likely primarily as a result of human-induced climate change.

Sea level rise in Manila Bay as being attributed by some sectors is due to the large withdrawal of groundwater. Groundwater extraction is one of the main reason Manila Bay sea level us increasing and declining land elevation.

With regards to the proposed project, the displacement of sea body by land of approximately **0.036 Cu. Km**. is considered insignificant and not directly causing sea level rise. Sea level rise can be most attributed to climate change and groundwater

extraction. If there will be a rise of sea level in Manila Bay, it will essentially dissipated in the West Philippine Sea to which the bay is connected as seen in **Figure 3.3.**

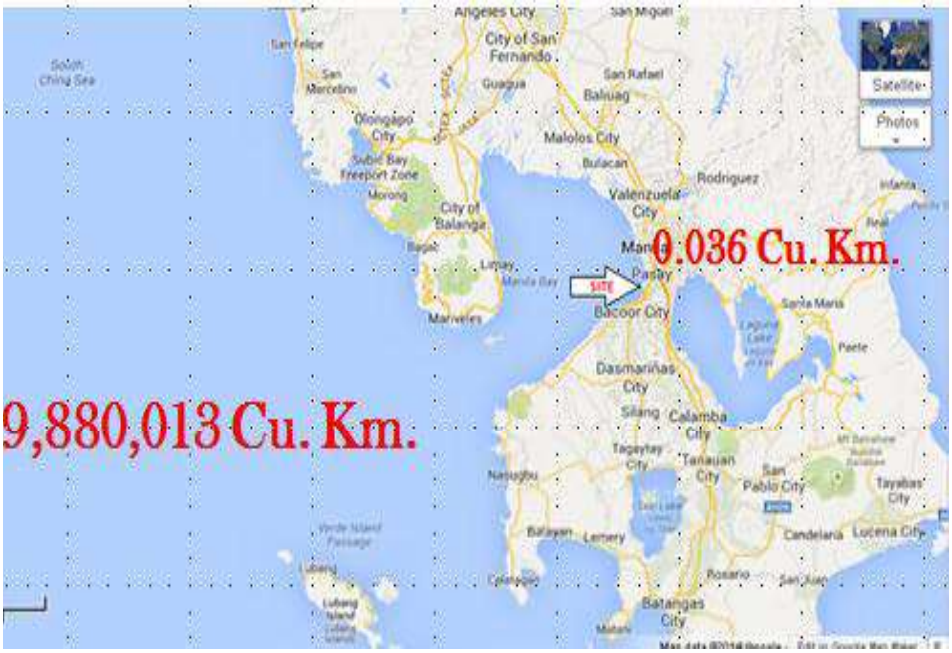


Figure 3.3 Comparative Volumes of Displaced Water at Reclamation Site and of the China Sea Volume

3.1.6 Competition for Water Resources

The proposed project will have no competition in terms of water resources because reclamation activities are generally "dry". There will be no major water use by the proposed project particularly from the process/technology aspects. The use of water is only intended for domestic use and for general housekeeping.

Moreover there will be no underground water abstraction to be applied because this could directly affect the community and the existing establishments surrounding the proposed project. The contractor is expected to source water temporarily from water Service Company during the stabilization phase for the reclaimed land as water may be used.

3.1.7 On the Ambient Air Quality

Reclamation works or the activities involved in the proposed project are confined to the Manila Bay water and is limited in duration to a period of approximately two (2) years only.

The potential air pollution discharges can result from the use of fossil fuels by equipment and machinery and in the movement of barges which is located away from the population centers. Any air pollution will not reach the population noting further that there is a buffer zone between the reclamation site and the area east of the site which is the direction of prevailing wind, referring to the Wind Rose Diagram.

- **Noise (Nuisance) Generation**

Noise generating activities e.g. pile driving, operation of rotating equipment (pumps) will be confined at the sea. Hence, noise will not be a significant nuisance because the population center is distant from the activity areas and the construction works will be phased and limited in duration to a period of approximately two (2) years only. In addition, nighttime activities involving heavy equipment shall be avoided as maybe practical

- **Odor (Nuisance) Pollution**

  There are no perceived chemicals, substances or materials nor activities to be employed that will contribute to significant odor pollution.

3.1.8 On Solid Waste Generation

Solid wastes to be generated are specific to the type and site of activities.

- The use of construction equipment will necessarily involve fossil fuels and products such as lubricating oil. Waste products from such equipment will not be disposed to the bay waters and instead be disposed to DENR-accredited third party TSD entities.

  On the other hand, maintenance works on the machinery and equipment will be confined to the maintenance shop(s) on shore.

- Silts are the solid wastes from the dredging of undesired sea bed materials. Silt curtains will be used as waste management facility to contain the dispersal of these materials.

- Domestic wastes from workers during constructions stage will be monitored through visual count weekly and the number of garbage cans/containers picked up by the garbage disposal unit of the City of Pasay.

3.1.9 Impacts on People

There are no settlers at the project site; hence the issue of resettlement does not exist.

However, there are fisher folk who undertake fishing activities for household or small scale sale and use a portion of the Libertad Channel near the Diokno Highway for anchoring their boats (See **Plates 2.4.3-2.4.4** and page **2.4-63 – 2.4-64**).

The proponent which is the LGU itself will need to address the question of legality of this operation especially if the fisher folks are not proven to be residents of Pasay and on the other hand the need to alleviate poverty.

3.1.10 Other Impacts and Corresponding Mitigating Measures

3.1.10.1 Waste Water Treatment (Also discussed in Section 2.2.3.)

For the reclamation phase, wastewater will be generated at the various/specific work stations, i.e. at the barges, pile driving rigs (if applicable), at the various phases of the actual reclamation works and during the land stabilization phase. The wastewater will be domestic in nature. Use of portable toilets or facilities on board barges/vessels will most likely be employed by the contractor with disposal of these through third party accredited waste treating entities.

3.1.10.2 Impacts and Management Associated with the Construction of the Access Road/Bridge

Potential impact would relate to:

- ***Traffic disturbance***. This can be made by coordinating the construction works with the city.

- ***Generation of garbage, solid and domestic aqueous wastes.*** The contractor will be required to comply with the applicable environmental laws and provide the appropriate mitigating measures at their expense.

3.1.10.3 Impacts and Management Associated with the sourcing of filling and burrow materials

- The dredging and extraction works at the San Nicholas Shoal are subject to separate ECC application and if granted to conditions attached to the ECC.
- The potential damage to the fish pens along the navigational lane of the trailer dredging vessel will be the direct responsibility of the dredging contractor, due care and the use of prescribed navigational aids will be exercised by the dredging contractor.
- Related to the operations of the fish pens, the legality of the operations is a matter that the concerned LGU needs to look into.

3.1.10.4 Impacts on Mangroves, wetlands, mudflats and natural habitats

These resources are absent at the impact zones of the project. The nearest mangroves are located at approximately 2.06183 kilometers from the project site as shown in **Figure 3.4.**



Figure 3.4 Map of the Mangrove Community nearest the Project Site

3.1.10.5 Competition or Disturbance of Waterways in Manila Bay

There are no navigational or waterways in the impact areas of the project site.

3.1.10.6 Alteration of the Manila Bay Coastline

The current and future / final master planning for the project will not adversely impact on the coastline. The boundary of the 60 hectare reclaimed land will impinge on the existing coastline but will also create a parallel coastline. On the other hand, the boundary of the 300-hectare reclaimed land is far distant from the existing coastline to significantly affect it.

3.1.10.7 Impacts on the Manila Bay Morphology

Impacts on coastal morphology are addressed / mitigated through (a) the location of the site and the buffer zone (b) minimal wave action impacts as shown by the results of the mathematical modeling.

On the other hand, the sea bed of the reclamation site will be permanently changed and replaced with a new and engineered land form. Some degree of seabed subsidence will be initially experienced during the period of soil stabilization; however, this will be essentially arrested when complete stabilization is attained. Thus mitigating measures will be applied. This will be consists of (a) proper reclamation technology especially in the stabilization of the reclaimed land and (b) effective removable of water in the interstices of the fill materials will be affected made through application of specialized methods such as the application of wick drains.

Impacts on Erosion

- **Vertical Containment Structure**

The construction and installation of vertical containment structure will serve to prevent soil erosion.

Erosion of the existing seawall will be effectively prevented by (a) the distance of the 300-meter reclaimed area from the shore line and (b) by aligning the southern boundary of the 60-hectare reclaimed land directly with the existing shoreline such that wave action from the sea will not disturb the shoreline.

Impacts on Sedimentation and Accretion

The modeling results which considered dispersal, dilution, accumulation pattern show that:

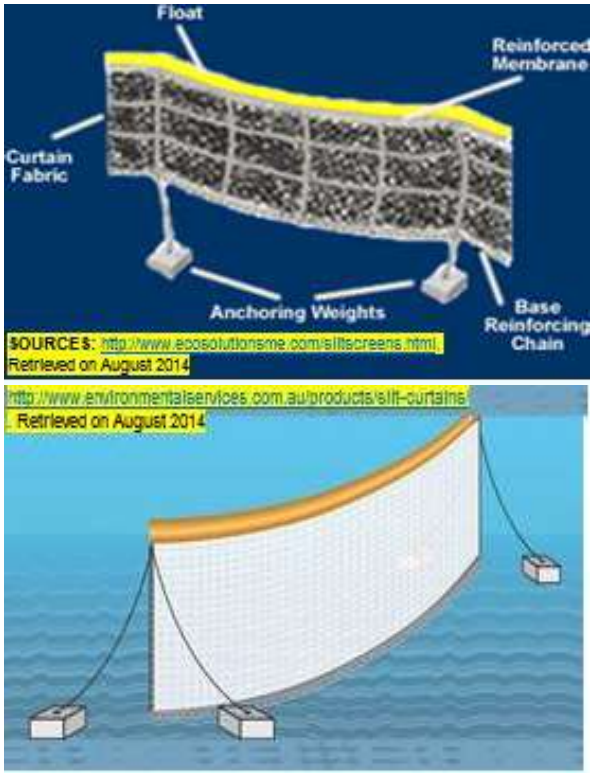
- *During tidal flooding and ebbing processes with prevailing southwest monsoon winds, the particles extended far away from the source with particle concentrations, especially near the source, greatly diminished;*

- *At the end of the 15-day simulation period for amihan wind condition, the model predicts that the number of particles present near the project site tend to increase when reclamation works are in place;*

- *..the reclamation project reduces the mixing processes resulting to marginal increase in concentration of tracer plume. Without the project, the tracer level inside the harbour is less than 1.5 mg/L and is predicted to increase to about 2.0 mg/L once the project is in place….;*

Impacts on particle movement/dispersion

From the particle tracking and pollutant tracer modeling studies, results revealed that the project area has an effective mixing mechanism to transport and dilute the pollutants. This could mean that the area is capable of minimizing potential impacts arising such as accidental spill of pollutants from upstream sources. While the model results revealed that the proposed reclamation project moderately alters the water movement and transport patterns due to the reduced flow velocities immediate of the project area, the water quality model results (represented by particles and tracer concentrations) showed that the increase in concentrations are not too significant to warrant changes in the present DENR classification of the Manila Bay area once the proposed reclamation works pushed thru.



Engineering intervention, e.g. the use of silt curtains will mitigate the impacts on sedimentation, accretion and particle movement/dispersal. It is a flexible sediment control barriers designed to prevent the spread of silt and sediment in the water.

Plate 3.1 Photograph of a Silt Curtain



3.1.10.8 Land Subsidence in Metro Manila

In so far as Metro Manila is concerned claims have been made that:

The land (in Metro Manila) is subsiding about 30 times faster, mainly from over-pumping of ground water. The added weight of new buildings in reclaimed areas may also speed up the sinking of the land that is occurring in Shanghai. The proposed reclamation areas are said to be experiencing up to 5 centimeters or about 2 inches per year.

Clearly inasmuch as land subsidence is attributable to ground water extraction which is widely practiced in Metro Manila, and considering that the project will not extract ground water both during the construction and operations phase this impact is absent and no mitigating measures are necessary.

On the other hand, given that the root cause of subsidence is excessive ground water extraction and the project will not undertake such activity it is seen that the project will not cause or contribute to land subsidence. During the reclamation phase there will be minimal water usage such being accounted for by the needs of the construction workers, the reclamation works being a “dry process”.

3.1.10.9 Accidental Oil Leaks/Spills

The proposed project will install or secure necessary emergency response facilities/equipment, e.g. fire fighting system, oil spill containment boom, vehicles for transport of injured personnel, etc.,

Oil spill booms will be kept ready for use in an event of accidental oil spills. In such event, the spilled oil will be recovered by pumping from the sea water, stored in tanks/drums for disposal on shore to third party accredited disposal facilities. Another method of oil recovery is by absorption by appropriate oil-absorbent materials, and thereafter recovery of the oil-soaked materials and disposal on shore through an accredited third party entity.

Further, the proponent will secure approval of its project Oil Spill Contingency Plan (OSCP) from the Philippine Coast Guard (PCG) before project implementation, and ensure that the vessels that the project will use, secures government permits for transport, storage, dumping and disposal of any material to and from the project. In an event of oil spills, although remote of significant oil spills, assistance from the PCG will be sought.

3.1.1.10 Dumping of Unwanted Dredged Materials

Strictly the unwanted dredged materials may not necessarily be considered wastes since these originate from the seabed itself.

Disposal/dumping will be made in a separate portion of the bay near the project site after seeking clearances with authorities and affected Manila Bay users, if any.

3.1.10.11 Inconsistency with or Violation of Applicable Protected Area Proclamations/Issuances

The project site is not within a NIPAs protected area. It is also distant from the Las Pinas-Paranaque Critical Habitat Area as shown in **Figure 3.5.**



Figure 3.5 Map Showing Distance of the Project from the Las Pinas-Paranaque Critical Habitat Area and Coastal Bay

3.2 Operations Phase (Construction of Structures, Buildings and Occupation of the Reclaimed Land by Various Locators)

The operations phase is not within the scope of the project and this EIS Report. Thus, the said phase is not included in this document that serves as an application for an Environmental Compliance Certificate.

3.2.1 Opportunities for Livelihood, Employment and Businesses

The residents and constituents of Pasay City will directly benefit from the reclamation project. This is perceived to have numerous employment opportunities that shall be opened up and be made available to them. The proponent shall give priority to qualified residents of Pasay City in filling up the manpower requirements of its consultants and contractors during the construction stage of the project and of its locators and tenants upon operation of the various businesses that shall set-up and locate within the project area.

Employment opportunities alone are open to more than 2 Million people.

Projected Increase in Value of Land and Properties within the Impact Areas

Various stakeholders located and operating within and around the proposed reclamation area will substantially benefit from the project. First and foremost, the City Government of Pasay and the Philippine Reclamation Authority (PRA) will jointly acquire and own, after the completion of the project, 75.6 hectares of prime developable land at no cost to them and which will have an estimated value upon completion, of Php 68.04B. add to that the real estate taxes due on the reclaimed land, the business taxes that shall be paid by the various locators and businesses that shall set up shop and locate within the developed area and the fees that shall accrue from the permits and licenses that shall be issued arising from the construction and operating activities within the area. All these additional revenues shall accrue to the city. The City Government of Pasay will have at its disposal, increased budgetary resources to fund priority sectors such as social services, education and health care.

The project will likewise open up new opportunities for local businessmen, suppliers, investors and entrepreneurs to expand their operations and businesses particularly those engaged in food and retail, provision of services such as transport and housing, and entertainment and trade exhibitions. Their participation and investment will be encouraged to jump-start the development of the area.

Thu, there are no sound bases for perceptions that the project will adversely impact on people in terms of devaluation in the value of real properties

Impacts on Traffic

Though the proposed project is only intended for land reclamation, there will still be an increase of vehicular movements within the site.

Thus, the project proponent which is the City of Pasay will be in closely coordination with neighboring cities and MMDA to be able to fully implement effectively traffic management measures and will not contribute to traffic congestion.

Provided in **Figure 3.6** is the map showing the future C6 road which will ease the volume of traffic in the area.



(SOURCE: http://ncts.upd.edu.ph/old/roadsafety/docs/3rd_urpo.pdf. Retrieved on August 2014)

Figure 3.6 Map showing the future C6 road (in red bold line)

Further the continuing initiatives of the MMDA and the on-going construction of infrastructures solitary built for traffic decongestion of the government will benefit this project such as

- The recent (January 2014) announcement of the use by the MMDA of modern CCTV in monitoring traffic as well as the strengthening of the "Non-Contact" apprehension plan will greatly help.

- Additional expressway project being constructed and intended to alleviate existing and future traffic problems going to and from the MIA/NAIA Complex. (**See Plate 3.2**).

It may be expected that when DPWH and MMDA firms up the details of their plans coordination with all of the reclamation project developers will be made especially the neighboring cities of Pasay particularly the Cities of Manila and Paranaque.

On-going and Planned Infrastructures for Traffic Decongestion

Expressway project intended to alleviate existing and future traffic problems

A photograph of the ongoing construction is shown in **Plate 3.2.**





Plate 3.2 Ongoing Construction Of Elevated Roadways

3.2.3 Potential Flooding

As adequately discussed in other sections of this EIS (**Section 2.2.1**) there will be no significant impacts attributable to the project.

3.2.4 Successful Reclamation Projects

The existing reclaimed land in the coastal area of the City of Pasay is itself a testament to a successful reclamation project.

Other success projects:

SUCCESSFUL RECENT EXPERIENCES	Reclaimed Area
Wan Chai Reclamation Phase I (Island Reclamation for the Hong Kong Convention and Exhibition Centre Extension)	70,000 m² reclamation
CCP complex island (CCP theater, Philippine Convention Center, star city, etc.)	77hectare reclamation
Financial Center Area Complex (GSIS/Senate Complex, PNB Complex and World Trade Center)	77 hectare reclamation
Central Business Park I - A (CBP I-A) – City of Pasay (SM corporate office, the Mall of Asia, SM Convention Center, the Promenade and the Sea Residences)	200 hectare reclamation
The Central Business Park I-BC or Aseana Business Park (New DFA, Little Binondo, Uniwide sales Costal Mall, and the only residential at the area Sole Mare Parksuit. The ongoing construction of the Bagong Nayong Pilipino and the first phase of the Pagcor's Entertainment City is the Hallmark of these future development)	204 hectare reclamation
The Central Business Park II- Commercial and Mixed Use Provincial Transport Terminal)	43 hectare reclamation
Asia World – Mix Development of Residential and Commercial Use	173 hectare reclamation
Centennial City or Cyber Bay Reclamation – It will host a world-class golf course, and prime residential villages.	750 hectare reclamation
Las Piñas - Parañaque Coastal Bay Project	635 hectare reclamation
Mactan North Reclamation and Development Project	400 hectare reclamation

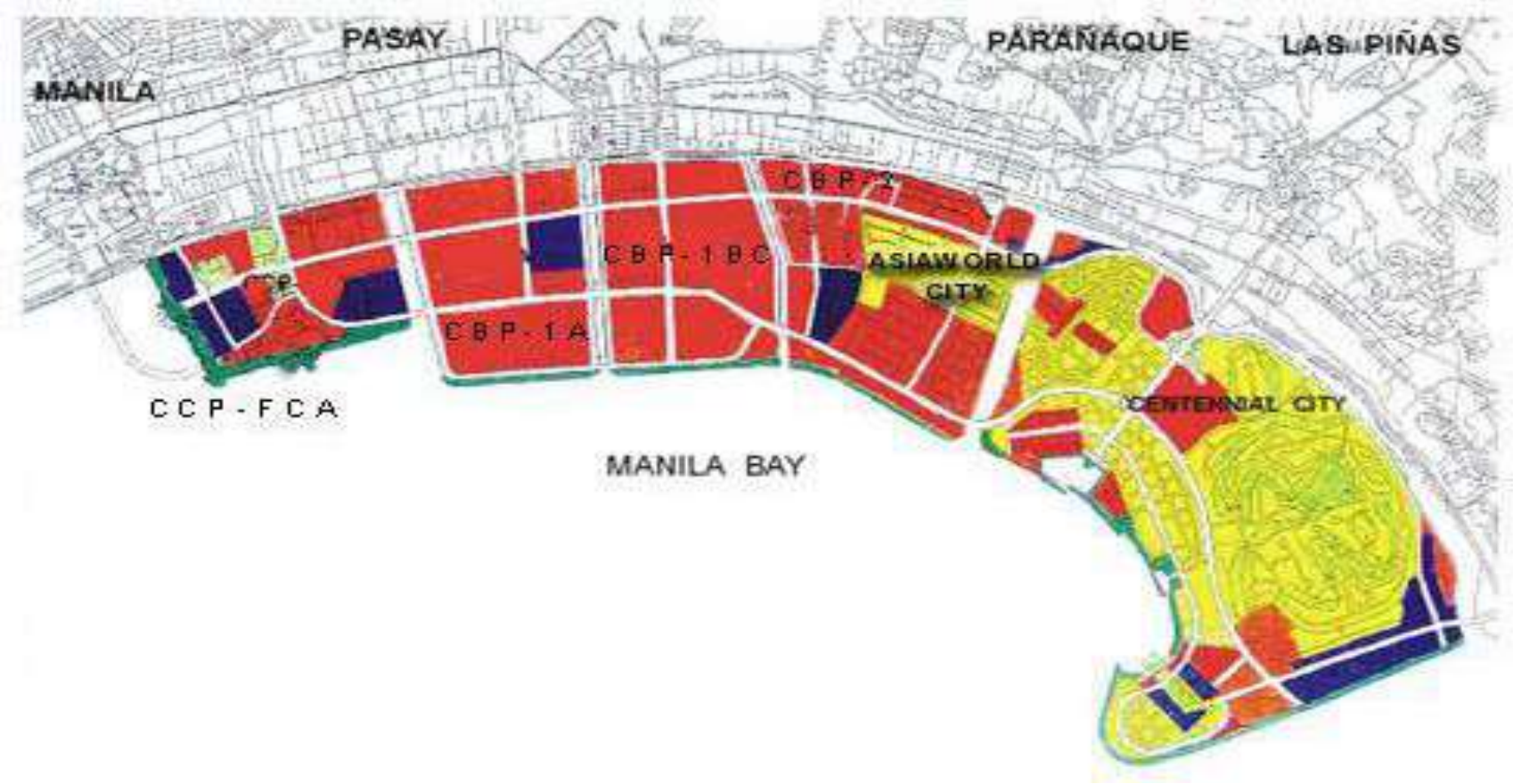


Figure 3.7 Boulevard 2000

Other examples of reclamation:

- **Jurong Island, Singapore**



- **Fudai Seawall**

Based from the website dailmail.co.uk, Fudai Seawall stands as tall as ever after. No homes were swept away. In fact, they barely got wet. Fudai was protected by a 15.5-meter (50-foot) seawall, and the tsunami was no match for it. Fudai had no deaths in the disaster.



Table 3.1 IMPACT MANAGEMENT PLAN (IMP)

Project Phase / Environmental Aspect (Project Activity Which Will Likely Impact the Environmental Component)	**Environmental Component Likely to be Affected**	**Potential Impact**	**Options for Prevention or Mitigation* or Enhancement**	**Responsible Entity**	**Cost**	**Guarantee / Financial Arrangements**
I. PRE-CONSTRUCTION PHASE	**Not Relevant No Impacts during this Phase. No activities at reclamation site except survey works.**					
II. CONSTRUCTION PHASE						
Environmental Aspect # 1	A. The Land	Perception of Flooding On Shore as a result of reclamation	Reclamation itself provides protection against storm surges and thus against floods.	Not Applicable	Not Applicable	Not Applicable
			Flood water pathways in Pasay is **NOT** directed towards the project area, (Per the NOAH Project)	Not Applicable	Not Applicable	Not Applicable
		Ground shaking and liquefaction	Engineering intervention: structural and engineering designs to withstand earthquakes and liquefaction.	Engineering Consultants	Incl. in master plan cost	Not Applicable
			Phil. standards	Engineering Consultants	Incl. in master plan cost	Not Applicable
		Disturbance of flora and fauna	Avoidance of disturbance of habitat and bird food	Reclamation Contractor	Part of project cost	Not Applicable
		Mangroves absent at the project site	Master plan will consider feasibility of enhancement of habitats, including growing of mangroves near site	Reclamation Contractor	Part of project cost	Not Applicable
		Exotic and rare bird species sighted hovering over the site and immediate vicinity.		Reclamation Contractor	Part of project cost	Not Applicable
		Damage to roads	Avoidance/Location of access roadways	Reclamation Contractor	Part of project cost	Not Applicable
		Incl. Diversions of access points		Reclamation Contractor	Part of project cost	Not Applicable
	B. The Water-Manila Bay No rivers, creeks, lakes at site	Permanent loss of Manila Bay water equivalent to 360 has.	Irreversible. Comply with PRA Notice to Proceed. Creation of equivalent water volume at the San Nicholas Shoal	Proponent/ Contractor	Part of project cost	Contract with PRA
		Silt dispersal to Bay due to	Silt curtains/containment	Proponent/	Part of contract	EIA Commitment

Project Phase / Environmental Aspect (Project Activity Which Will Likely Impact the Environmental Component)	**Environmental Component Likely to be Affected**	**Potential Impact**	**Options for Prevention or Mitigation* or Enhancement**	**Responsible Entity**	**Cost**	**Guarantee / Financial Arrangements**
Environmental Aspect # 2		dredging/filling operations	at perimeters	Contractor		
		Turbidity Increase	Dredging/filling methodology; Stockpiling of earth fill shall be placed away from water bodies and covered with suitable material during rainy season	Proponent/ Contractor	Filling materials sourcing not in scope of EIA	ECC or applicable regulations MMT
		Potential contamination with substances in filling materials	Pre-screening of filling materials; possible sourcing from Manila Bay	Proponent/ Contractor	Part of contract	ECC commitment MMT
			Observe project boundaries	Proponent/ Contractor	Part of contract	ECC commitment MMT
	Libertad Drainage Channel	Domestic wastes from construction crew and possible hazardous waste material accidental spillage	Appropriate toilet facilities	Proponent/ Contractor	Part of contract	ECC commitment MMT
			Oil and lubricants (used or spent) should be collected and treated by TSD facility	Proponent/ Contractor	Part of contract	ECC commitment MMT
	Manila Bay	Not disturbed by the Project	Insignificant ecologically important marine life	Proponent/ Contractor	Part of contract	ECC commitment MMT
		Potential damage to marine life		Proponent/ Contractor	Part of contract	ECC commitment MMT
			Containment wall	Proponent/ Contractor	Part of contract	ECC commitment MMT
Environmental Aspect # 3	C. The Air	Noise	Temporary-construction - short time only	Contractor	Part of contract	MMT
		Emissions if power generating sets used and fossil fuel using equipment	Use of quality fuel	Contractor	Part of contract	MMT
			Proper maintenance of gensets	Contractor	Part of contract	MMT
Environmental Aspect #4	D. The People	Essentially none-no settlers to be displaced because the area is uninhabited	Enhancement	Proponent	Not Applicable	MMT
		Livelihood and employment opportunity	Enhancement	Proponent	Not Applicable	MMT

Project Phase / Environmental Aspect (Project Activity Which Will Likely Impact the Environmental Component)	**Environmental Component Likely to be Affected**	**Potential Impact**	**Options for Prevention or Mitigation* or Enhancement**	**Responsible Entity**	**Cost**	**Guarantee / Financial Arrangements**
OPERATIONS PHASE	**THIS PHASE IS OUTSIDE THE COVERAGE OF THE RECLAMATION WORKS-For Reference Purpose Only**					
Environmental Aspect # 1	I. The Land ("Land" refers to the original on shore land not to the reclaimed land")	Traffic density increased	Traffic Management	In coordination with MMDA and LGU	To be included in operating cost	Not applicable
			Internal circulation within the reclaimed land	In coordination with MMDA and LGU	To be included in operating cost	Not applicable
Environmental Aspect # 2	II. The Water	Generation of domestic wastes	Individual and centralized treating system(s)	Proponent	Part of Project cost	EIA Commitments
		Damage to Marine Water And Species		Proponent	Part of Project cost	EIA Commitments
Environmental Aspect # 3	**III.** The Air	Air pollution from vehicles	Traffic Management Quality motor fuels	Proponent	Not applicable	RA 8749
Environmental Aspect # 4	IV. The People	Enhancement	SDP / IEC	Proponent	Part of Project Cost	ECC Conditions and commitments in the EIS
	Migration/In migration		Preferential hiring of qualified residents	Proponent	Per agreement with affected sectors	Separate agreements reached
	Livelihood and Employment			Proponent	Not applicable	Agreement w affected sectors
	Health		Same as in air module			SDP
IV. ABANDONMENT PHASE	**THE PLANS FOR REHABILITATION, ABANDONMENT AND DECOMMISSIONING WILL NECESSARILY BE COMMUNICATED WITH THE DENR/EMB FOR THE LATTER'S REQUIREMENTS AND APPROVAL**					
Environmental Aspect # 3	A. The Air	Not Relevant	Not Relevant	N/A	N/A	N/A
Environmental Aspect # 4	B. The People	Loss of employment	Payment of Social benefits			DOLE Rules on Labor Standards

SECTION ES. EXECUTIVE SUMMARY

ES.1. Project Fact Sheet/PD Summary

ES.1.1 Project Title and Basic Project Information

ITEM	Project Information
Name of Project	**Proposed 360 Hectares Reclamation Project**
Location	Along Coast of Manila Bay, City of Pasay
Nature of Project	ECP in an ECA (Presidential Proclamation 2146 dated 14 December 1981)
Project Classification & Type	Major Reclamation Project ≥ 50 hectares
Project Classification Code	D.1.
Size/Scale	360 Hectares
Status of ECC	Being Applied For

ES.1.2 Project Proponent/EIA Preparer

ITEM	Project Information
Project Proponent	**Pasay City Government**
Contact Address	Pasay City
Telephone Number	(02) 833-3729
Responsible Officer	**Atty. Severo Madrona Jr.**
EIA Preparer	Technotrix Consultancy Services, Inc.
Contact Person	**Edgardo G. Alabastro, Ph.D.**
Address	Unit 305 FMSG Building, Balete Dr. QC 1101
Contact Numbers	(632)416.4625; 0917.8255203
Email address	technotrixinc@gmail.com

ES.1.3 Project Location and Area

The **Environmental Compliance Certificate (ECC)** being applied for the **Proposed Reclamation Project** involves a total area of approximately **360 hectares**.

- **Location and Political Boundaries**

The project site is located within the waters of the Manila Bay along the coast of the Pasay City, Metro Manila, National Capital Region (NCR).

Provided in **Figure ES.1** is the NAMRIA map and in **Figure ES.2** the aerial satellite map of the proposed project site.

ES.1.4 Project Details

- **Rationale for Increase in Reclamation Area From 60 Hectares to 360 Hectares**

Originally, the city was applying only for a 60-hectare project which was granted approval by the PRA shown in **Annex 3.**

The city decided to expand the project by 300 hectares or to a total of 360 hectares, the expansion site being immediately adjacent to the original project location.

The basic rationale for the expansion is as follows:

Former President Benigno Aquino's pronouncement in his 2013 State of the Nation Address (SONA, mentioned that his administration's desire to pursue the reclamation of additional lands to raise funds for the modernization of the AFP, as well as in support of the administration's initiative to put up a government center within the new reclaimed areas to serve as a central location for key offices of the three (3) branches of the government.

The city conducted a series of Public Hearings as provided in **Table ES.2.** After successful conduct of Public Hearings, the City Council approved the expanded project.

Thereafter, for the securing of an ECC for the 360-hectare project, a Public Scoping for the expanded area was conducted last 09 July 2014 at the PICC Hall and submitted a Public Scoping report to the EMB-Central Office as a requirement prior to the conduct of a Technical Scoping.

- **Authority of Proponent over Project Site**

Under current regulations of the NEDA which has been given the mandate to take administrative supervision of the Philippine Reclamation Authority (PRA), an Environmental Compliance Certificate (ECC) is a pre-requisite to making a formal agreement with the project proponent (City of Pasay) for authority to develop the reclamation project.

The project will be located in portion of Manila Bay that is within the political jurisdiction of the City of Pasay, a fact that gives the City as Project Proponent the "Authority over the Site".

- **Area Clearance**

Pursuant to DAO 2007-20, the City of Pasay has filed an amended application for an Area clearance/Reclamation Permit with the Regional Executive Director of the National Capital Region, See **Annex 13.**



Figure ES.1. Location of Site in a NAMRIA Map



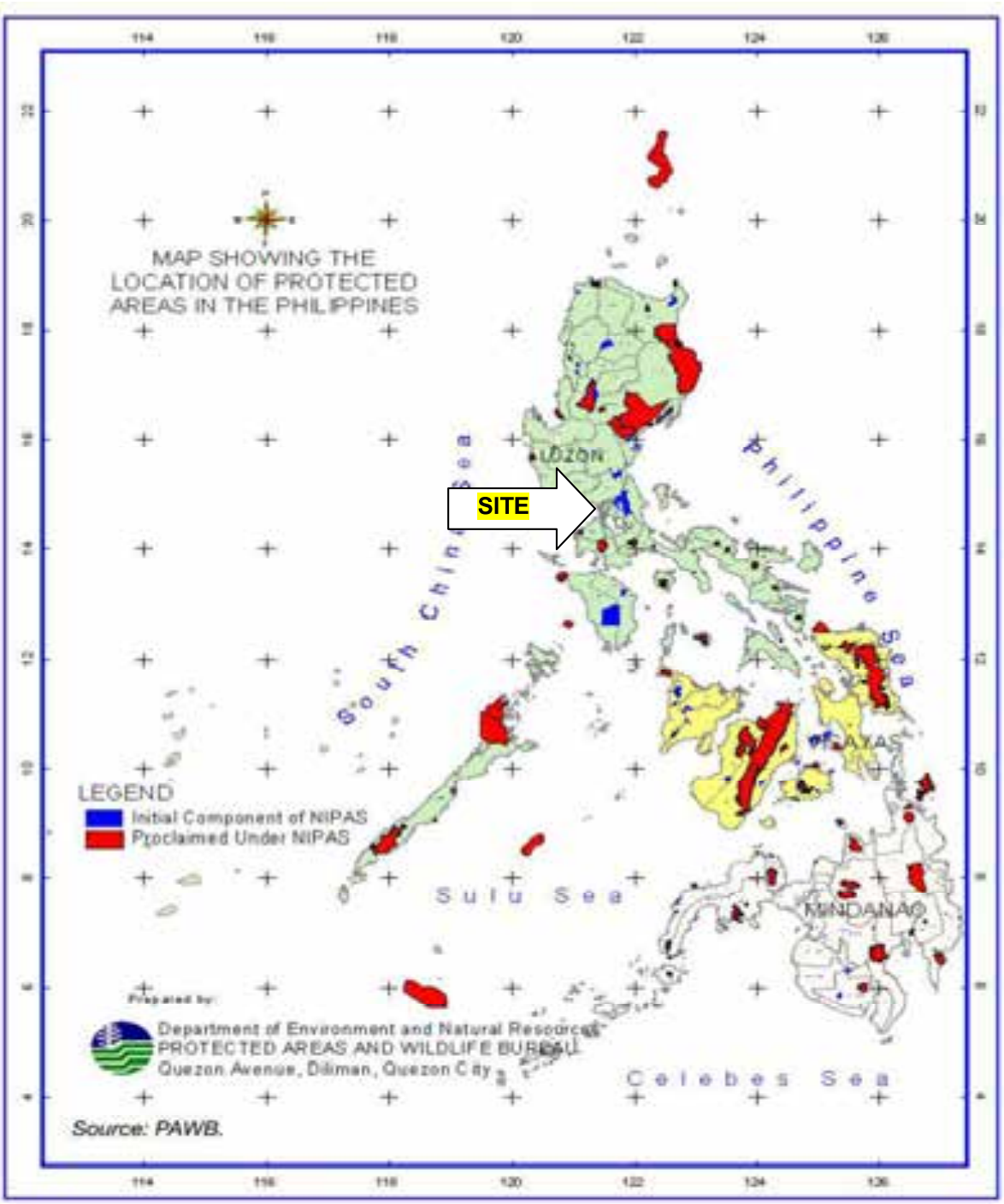
Figure ES.2. Location of Site

- **Environmentally Critical Areas (ECAs) and Protected Area**

  Protected areas or proclaimed areas/site within the project location are not germane because the project site is not situated within the identified Protected Areas based from the map of the Protected Areas in NCR as shown in **Figure ES.3a** and **Figure ES. 3b.**

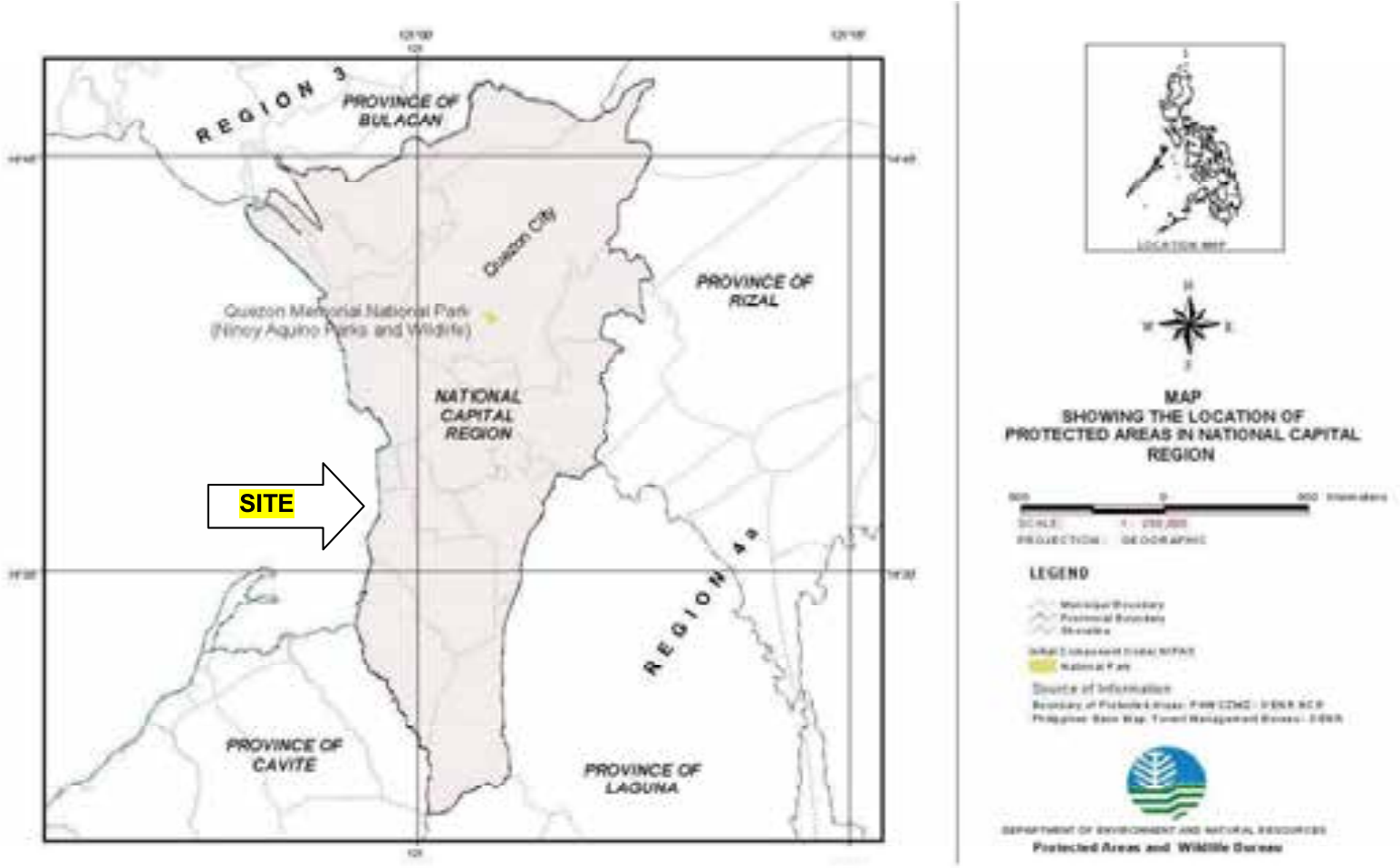
- **Accessibility**

  The project site is adjacent to a popular landmark, the Sofitel Philippine Plaza Hotel and is adjacent to CCP Complex, Roxas Boulevard. Access road for the proposed project will be built. Several offices near the project site are GSIS building, Sofitel Philippine Plaza, Cultural Center of the Philippines (CCP) and Coconut Palace. Provided in **Figure ES.4** is the vicinity map of the project site.



SOURCE: La Viña , Antonio G.M. et al., (14 March 2010). Legal Framework for Protected Areas: Philippines . Retrieved from http://cmsdata.iucn.org/downloads/philippines.pdf. August 11, 2014

Figure ES.3a. Map of the Protected Areas in the Philippines



SOURCE: http://bmb.gov.ph/images/stories/maps/ncr_map.jpg. Retrieved on August 11, 2014

Figure ES.3b. Map of the Protected Areas in NCR



Figure ES.4 Vicinity Map of the Proposed Project

ES.1.5 Project Components

The Preliminary Conceptual Master Development Plan is shown in **Figure ES.5** on which the following components will be constructed / installed.

- Reclamation of two (2) parcels of Bay water, 300 hectares and 60 hectares.
- 200-meter channel/buffer to provide adequate water circulation
- Containment Wall
- Construction of a minimum of two (2) bridges for the 300 hectare reclamation
- Dredging, Securing and Transport of Landfill
- Platform Elevation of 4.0 meters above mean lower low water level (MLLW)
- Proper/engineered drainage system
- Internal and access road networks
- Street lighting
- Electrical, water and communications connection lines



Figure ES.5. Preliminary Conceptual Master Development Plan

ES.2. Process Documentation of the conduct of EIA

(EIA Team, EIA Study Schedule & Area, EIA Methodology, Public Participation)

The EIA Report of this Proposed 360 Hectares Reclamation Project has been prepared in compliance with the basic principle of the Philippine EIS System (PEISS), i.e. that **an EIA/ECC is a planning tool and not a permit**, substantiated hereunder.

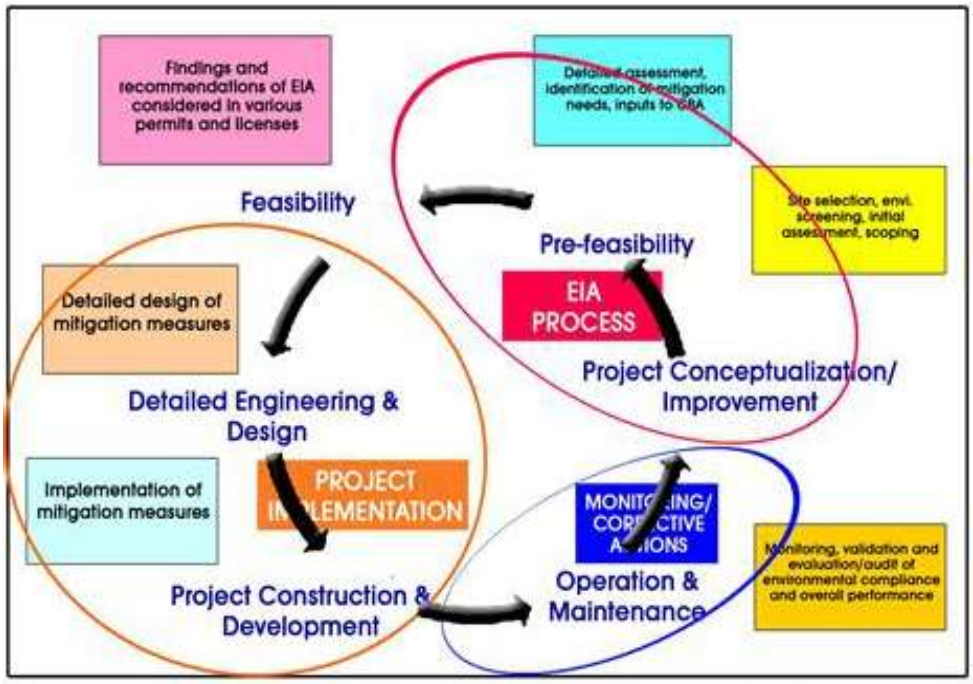


Figure ES.6 Chart Showing the Planning Tool Concept Based on DAO 03 30
(Reference: Revised Procedural Manual for DENR Administrative Order No. 30 Series of 2003 (DAO 03-30)

Guidelines and Regulations Complied With

a. The Revised Procedural Manual (DAO 03-30) stipulates this basic paradigm, shown in **Figure ES.6.**

b. The Public Announcement in a major daily newspaper of Former Secretary J.L Atienza asserting the Planning Tool concept of an ECC (**Page ES-10**).

c. In a Public Consultation for a Coal Power Plant Expansion Project in Subic, Zambales on 22 October 2012, in response to a question from one of the participants, the representative from the EIA/EMB stated that **"ECC is a Planning Tool".**

d. In the hearing of the Petition for Writ of Kalikasan against the Coastal Bay 21 Reclamation Project in Las Pinas-Paranaque, a primary witness declared that EIA/ECC is a Planning Tool.

e. In a Public Scoping for a Mining Project in Lobo, Batangas on 28 February 2014 , an EMB representative expressly stated the ECC is a Planning Tool.

f. In an ECC recently granted by EMB Region IV-A it was specifically stated that an ECC is a Planning Tool, shown verbatim below:

This is to certify, further, that in issuing this **CERTIFICATE**, it should be understood that the same is a **PLANNING TOOL** and **NOT A PERMIT**. Hence, the proponent shall secure pertinent **PERMITS/CLEARANCES** from all concerned government agencies (i.e. HLURB, NWRB, LGUs, DOH, DOLE, DTI, DPWH, MGB, DOT, PMRB, DENR, DOE, ERC, DOTC, DOST, etc.) prior to the implementation of the project to be submitted to this Office within sixty (60) working days upon receipt thereof; otherwise this Office shall be constrained to take appropriate legal action.

Issued at EMB CALABARZON Region this **May 27, 2016.**

g. Moreover, the details of a Project are established post-ECC, as stipulated in page 2 of the Revised Procedural Manual, quoted verbatim below:

iii) During the project's Detailed Engineering Design (DED) stage, which is post-ECC, the generic measures identified during the EIA study at the FS stage will now be detailed based on the project facility design and operational specifications. Additional baseline monitoring may also be required prior to construction or implementation of the project to provide a more substantive basis for defining the environmental management and monitoring plans.

Public Announcement by the DENR previously published in a national newspaper



DUE PROCESS IS A REQUIREMENT OF GOOD GOVERNANCE

t Department of Environment and Natural Resources presents its position on the mining project in Mindoro as gards the following issues raised in an earlier paid advertisement in this paper and subject also of an on-going demonstration in front of DENR premises:

recognition of the LGUs' moratorium on mining.

- The DENR recognizes the moratorium, but this is a separate issue. Based on PD1586, the DENR, through the ECC, is mandated to assess the environmental impacts of an environmentally-critical project and prescribe mitigating measures to address these pre-identified impacts, regardless of any existing moratorium.

  The DENR stresses: (a) ECC is a planning tool, not a permit. It is supposed to guide the LGUs and other concerned agencies in the issuance of their permits; and (b) The LGU is responsible for upholding the local moratorium.

failure of Intex Resources to conduct genuine consultations in the affected communities.

- DENR officials claim that they conducted public hearings in the municipalities of Pola and Mamburao, while Intex Resources conducted consultations and public scoping sessions in the areas of Calapan, San Teodoro, Victoria, Pola, and Sablayan, where the affected communities are located. These consultations/hearings were conducted to generate environmental concerns of the community, not social acceptability.

steadfast refusal of LGUs to allow the entry of Intex Resources in the areas.

The Revised Procedural Manual specifically in reference to the EIA documentation as amended by the existing guidelines contained in the Memorandum of Secretary Joselito L. Atienza dated 29 September 2009 and the latest issuance on EIA Rules, the DMC 2010-14 were followed. The streamlined procedural guidelines discussed by EIA Preparers with the EIA/EMB Central Office

on November 2012 have also been complied with, along with the further requirements during the review process.

ES.2.1 EIA Team (Proponent & Preparer Team members, module of involvement, expertise)

The table showing the list of proponent / EIA Preparers is shown below.

Table ES.1 List of Proponent / EIA Preparers

EIA Preparer	Module
Edgardo G. Alabastro, Ph.D.*	Team Leader; Air & Water and Numerical Modeling
Nadia C. Perez *	Project Coordinator
Maria. Catherine Rontos*	Technical Assistant
Susan S. Cruz	Socio-Economics
Angelie Faye Nicolas*	Research
Kathlene Andrea Efe*	Research
Warren Conde	Research
Benjamin Francisco	Team Leader For Marine Module
Michael Chester Francisco	Resource Person For Fishery Module
Hernani Bayani	Geology
Jeramee Dimapilis	Ocean Dyanamic Modeling Adviser

**Have participated in the EMB Orientation Seminar on CCA and DDR*

ES.2.2 EIA Study Schedule

The EIA for the proposed project started on January 2013.

Table ES.2 EIA Study Schedule

STUDY FOR THE PROPOSED PROJECT	
ACTIVITY	**DATE**
• Baseline data for Air and Noise	• January 2013
• Baseline data for Water	• November 2012
• Marine Study	• November 2012 • August 2016
• Technical Scoping by the Environmental Impact Assessment and Review Committee (EIARC) with the Case handlers and EIA Preparers	• 08 April 2013 (Proposed 60 hectares) • 07 August 2014 (Proposed 360 hectares)
SOCIAL PREPARATION UNDERTAKEN	
ACTIVITY	**DATE**
• Meeting with the LGU	• April 23, 2012 April 30 2012
• Public Scoping	• 20 February 2013 (Proposed 60 hectares) • 09 July 2014 (Proposed 360 hectares)
• Key Informant Interview • Public Perception Survey	• 29 May 2013 (Proposed 60 hectares) • 29 May 2013 (Proposed 60 hectares) • 11 August 2014 (Proposed 360 hectares)
• Public Hearing	• 23 August 2016

The following activities will still be undertaken to complete the EIS:

1. Review by EIARC
2. Revision of EIA Report based on the Review by EIARC (Item 1)
3. Decision-making on ECC Issuance.

ES 2.3 EIA Study Area (project area up to extent of coverage of study)

The delineation of the EIA Study Areas is based on the Direct Impact Area (DIA) and the Indirect Impact Area (IIA). These areas are identified in the discussions of the specific modules, i.e. Land, Water, Air and People and are depicted in **Figure ES.7.**

The guidelines provided by the Revised Procedural Manual relevant to this project are used for the delineation of the DIA and IIA, to wit:

a. **Direct impact area (DIA)** is … the area where ALL project facilities are proposed to be constructed/situated and where all operations are proposed to be undertaken. For most projects, the DIA is equivalent to the total area applied for an ECC.

For the proposed project, the DIA are:

- This is the reclamation site itself wherein the construction activities will take place.
- Portion of the Libertad Channel is regarded as a DIA because of its importance to flood mitigation and since its mouth is towards the 300-hectare reclamation site with a 200 m wide channel separation.
- The site for the disposal of the dredged out unwanted bed materials is still to be determined.

b. **Indirect Impact Area (IIA**) …an IIA can be the stretch of the river/s OUTSIDE the project area but draining the project site which can potentially transport Total Suspended Solids and other discharges from the project towards downstream communities.

For the proposed project, the IIA are:

- The access roads to the site are considered in the IIA because transport of certain construction crew, materials and equipment for the Construction Phase may use these roads (Diokno highway and road alongside the Film Center).
- The neighboring establishments, buildings and structures are considered part of the IIA.
- The navigational lane from the reclamation site and the source of fill materials (e.g. the San Nicholas Shoal) is considered as IIA.

The Social Impact Area (SIA)

- The entire City of Pasay is taken as an SIA because the benefits extend to the entire City in terms of employment and livelihood opportunities, taxes paid and a rare opportunity for acquiring land for development purposes without financial requirements.
- The fisher folks operating near the project site are deemed part of the Social Impact Area since the City is itself the project proponent it will manage the situation taking into consideration the mandate of the City (especially in respect of permitting requirements), the interest of its residents and of the fisher folks.

The DIA, IIA as well as SIA are given in **Figure ES.7.**

The EIA Study Area based on the Direct Impact Area (DIA) and the Indirect Impact Area (IIA) is further discussed in **Section 1.1.3** of this EIS Report.

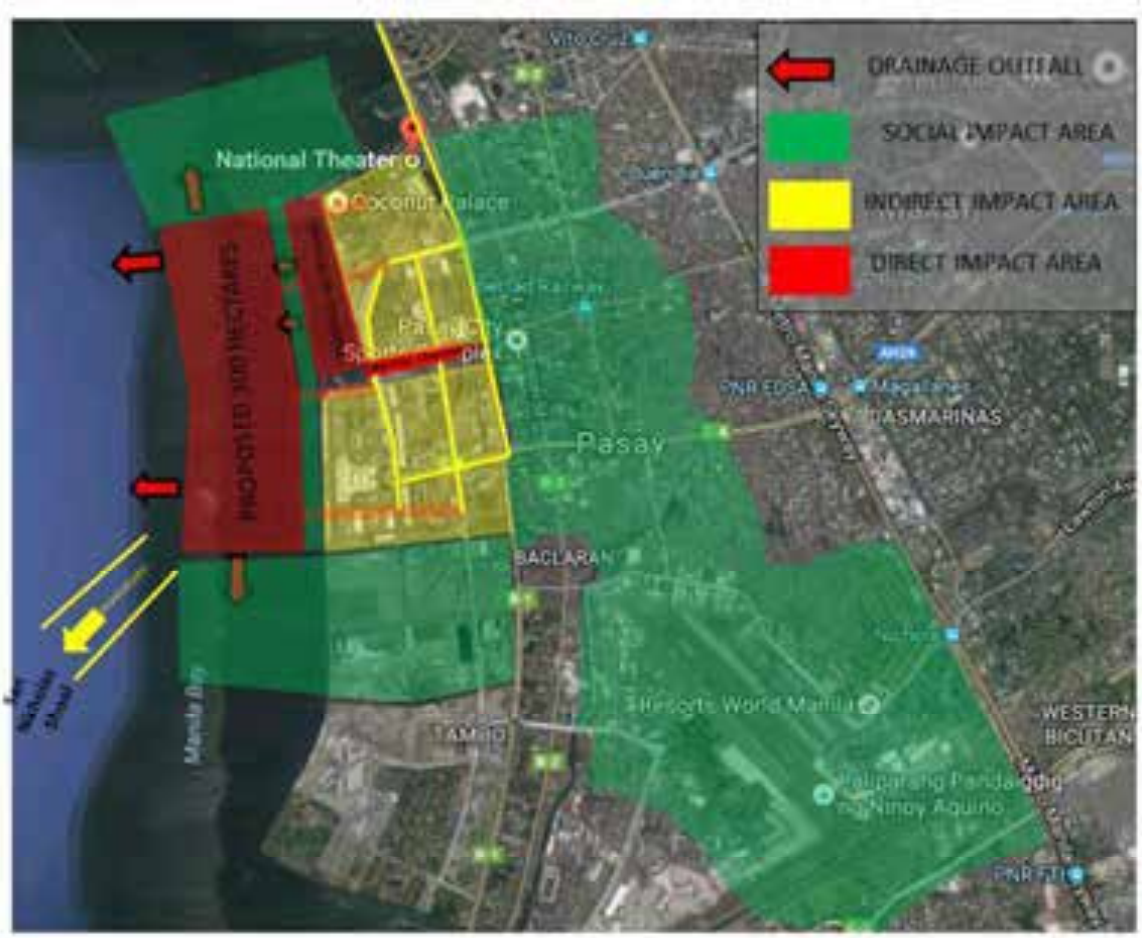


Figure ES.7 The Impact Areas

ES.2.4 EIA Methodology

The EIA Procedural Manual primarily dictates the EIA Methodology and the specific requirements of the EIA/Review Committee as reflected in the Screening Checklist determined during the Technical Scoping.

Table ES.3 EIA Methodology per Module

Resource	Methodology
LAND	
• Land Use Classification	**Secondary data:** Assessment of compatibility of the proposed project in the land use classification, Manila Bay Coastal Strategy, Boulevard 2000 Plan, Consistency with the PRA Implementing Rules and Regulations, Relation to the PRA Master Plan for Manila Bay, **Secondary data:** Relevance of the Continuing Supreme Court Mandamus on Manila Bay
• Geology	**Secondary data:** Geologic, seismic, liquefaction, slope hazard maps and evaluation based on government maps
WATER	
• Hydrology / Hydrogeology	Assessment of project impact on change in drainage morphology/local drainage resulting effects of flooding pattern in the project
• Marine Water Quality	**Primary data:** Standard Methods for Water Quality Sampling and Monitoring
• Oceanography	**Primary data:** Numerical Modeling for assessment of impacts **Primary data:** Bathymetric map; Predicted tides; 24-hour tidal cycles; Surface current system
• Freshwater Ecology	**Primary data:** Delineation of Fresh water bodies and if in impact areas, assessment of project impact in terms of threats to existence/and or loss species, abundance frequency and distribution species and overall impact to freshwater ecology.
• Marine	**Primary data:** Transect, manta tow and spot dives surveys, marine resource characterization (e.g. city/municipal and commercial fisheries data), Key informant interview. **Primary data:** Survey focused on the impact areas. Updated survey of significant fish population at the DIA.
AIR	
• Ambient Air	**Primary data:** Standard Methods for Ambient Air Quality Sampling and Monitoring

Resource	Methodology
• Noise	**Primary data:** Noise Meter
PEOPLE	
• Demographic Profile / Baseline	**Primary data**: Conduct of Public Perception Survey, Public Scoping **Secondary data:** 2011 Comprehensive Land Use Plan (CLUP) of Pasay City. National Statistics Office Website
ERA	
• Physical and Natural Environment	Annex 2_7.e of the Revised Procedural Manual

ES 2.5 Public Participation

Perception survey was conducted by the EIA team last May 29, 2013 for the Proposed 60 hectares. Pre-Scoping Information Education and Communication (IEC) Activities was conducted to highlight among others the new nature of the project which is the Proposed 360 hectares Reclamation Project. Focus Group Discussion (FGD) and Key Informant Interview were also conducted last August 8 and 15, 2014 to assess the stakeholder's perception since there are changes or additional land area.

- **Public Scoping**

At the time of the first Public Scoping conducted last February 20, 2013, the site being considered was only the Approved 60 Hectares Reclamation Project. However, it was decided later to have an additional 300 Hectares Reclamation Project. Public Scoping of the Proposed 360 hectares reclamation Project was conducted last July 9, 2014 with the same invitees for Pasay with supplementary invitees from National Economic and Development Authority (NEDA), LGUs of Las Piñas and Paranaque City.

The Public Scoping Report is shown in **Annex 2.**

Issues and concerns raised by the stakeholders during the conduct of Public Scoping for the Proposed 360 hectares Reclamation of Pasay City are summarized in **Table ES.4.**

Table ES.4 Issues and Concerns for the Proposed 360 hectares Reclamation of Pasay City

EIA Module	Issues/Suggestions Raised by Stakeholder	Sector or Representative Who Raised the Issue/ Suggestion	Proponent's Response	Page discussed in the EIS
Procedural Matters	Postponement of Public Scoping Per Letter of received July 7, 2014 Letter to Pasay dated July 4, 2014 attached		Public Scoping explained Public Consultations will be held (Letter of Pasay dated July 7, 2014 attached)	Not necessary to explain in the EIS Report

EIA Module	Issues/Suggestions Raised by Stakeholder	Sector or Representative Who Raised the Issue/ Suggestion	Proponent's Response	Page discussed in the EIS
	EMB should conduct this Public Scoping together with the Review committee not the Proponent. Procedure of EIS Process not following according to law. Public Consultation was not done for the Proposed Project unlike Paranaque	**Lou Arsenio- RCAM Ecology**	In accordance with the Procedural Manual for the PEISS Public Scoping is proponent driven together with their consultant. The Review Committee will be selected by the EMB after receipt from Proponent/Consultant of the results of the Public Scoping and of the Project Description, thus not present. The same process is observed for all other projects.	**Section ES.2 page ES-9**
	Venue of Public Scoping- Why conduct in PICC the Public Consultation not Pasay City Hall or conduct in the impact area	**Rogelio Weng Estrella - Pasay City Citizens League for Local Government**	It was reiterated that the meeting with the stakeholders is not a Public Consultation, but a Public Scoping. Compliance was made to the requirement/guidelines of EMB, to conduct Public Scoping near the project site and within the impact area. Several other venues were considered including the Pasay City Hall but the PICC was most suitable and also available. Moreover PICC is also in a reclamation site though this is not a basis for choice of venue.	Not necessary to explain in the EIS Report
	EMB should answer that Public Scoping is proponent Driven to be clarified by the process	**Grace Makabale–Save Freedom Island Movement**	It was reiterated that Public Scoping is proponent driven. The EIA document will be reviewed by Central Office. Engr. Gil Ferareza is here from EMB NCR as an observer. He attests to the Central Office his findings if the Procedural Manual has been complied him.	Not necessary to explain in the EIS Report

EIA Module	Issues/Suggestions Raised by Stakeholder	Sector or Representative Who Raised the Issue/ Suggestion	Proponent's Response	Page discussed in the EIS
	ECCs for Manila, Pasay and Paranaque are piecemeal. Programmatic ECC is suggested. What is the impact of the proposed project to the effect of ecosystem as a whole because we should look at all the aspects? There should be programmatic and not a single project approach The Supreme Court "Mandamus" should be observed	**Mr. Robert Rara, PEMSEA**	The Proponents for each project are different; thus one ECC for all projects neither practical nor legally correct, because each Proponent takes their own responsibilities to the environment. The Mandamus is duly noted.	Discussed in **Section 3.** Summarized in **Table 3.1.** Discussed in **Section 1 and 2.1.**
	The proposed project should be viewed integrally.	**Atty. Sonny Quial**	Duly noted (Similar comments as in the above)	EIS complied with RPM
	60 and 300 hectares should be consolidated in approach.	**Mr. Ong of Sofitel**	Duly noted (Similar comments as in the above)	Explained in **Section ES page ES-1.**
	Projections of the total areas of the different reclamation projects to assess the impact holistically.	**Sister Bernadeth Casas-Assumption Malibay**	Duly noted	Discussed in **Section 3.** Summarized in **Table 3.1.**
	We are not invited in this Public Scoping. Invitations were not sent to us.	**Councilor** **Bong Tolentino of Pasay City**	Invitations were properly sent and acknowledged received by the City of Pasay. Pasay itself is the Project Proponent	Invitations were sent to all legitimate stakeholders. See **Annex 2.**

EIA Module	Issues/Suggestions Raised by Stakeholder	Sector or Representative Who Raised the Issue/ Suggestion	Proponent's Response	Page discussed in the EIS
	Some of the slides are misleading from a scientific view. We should know the real issue to mitigate. Quoting personalities should not be made	**Marvin – Representative from National City Agency**	The guidelines of the Revised Procedural Manual are observed. Quoting personalities are made when their statements are made public such as in media releases.	Explained in the EIS and Public Hearing. See **Annex 14.**
	Public Consultation or Public Hearing-- The rights of the people should be heard. If Project is beneficial, Why are there no Public Consultation?	**Brother Tony Escalona**	This is not a Public Consultation but we will have a Public Consultation	Public Hearing Completed. See **Annex 14.**
1. **Project Description**	Are there any vertical development	**Edwardson Ong- Legal of Sofitel**	Mix Development. No particular development 30% will be roads and open spaces.	See **Section 1.4 Project Components**
	What is the development for the Proposed 60 and Proposed 300 hectares?	**Grace Makabale- Save Freedom Island Movement**	Mix Use Development- 30% are roads and open space based from the requirement of PRA. Mix Use, - commercial residential based from the need of the City.	See **Section 1.4 Project Components**
2.Land	200 m waterway of all the Proposed reclamation projects. Assurance of the people that there will be no flood and destruction of livelihood of the residents of Pasay, Paranaque and Las Piñas.	**Grace Makabale- Save Freedom Island Movement**	Engineering solutions / interventions to be detailed after the ECC. ECC will impose conditions and requirements. As an illustration there is a reclamation project that after the issuance of the ECC, circulation relating to flooding was studied and changes were made in the configuration.	Flooding discussed in **Section 2.3** and **Section 3.**
	When to conduct actual Environmental Geohazard and Geological Assessment (EGGAR)?	**Felix Tambuko**	This is only a Public Scoping. After this scoping there will a Technical meeting with the EMB and Review Committee composed of technical experts on Land, Air, Water. People etc.. The reports on geology, geological assessment and other hazards will the EIS.	Included in **Section 2.1.**

EIA Module	Issues/Suggestions Raised by Stakeholder	Sector or Representative Who Raised the Issue/ Suggestion	Proponent's Response	Page discussed in the EIS
	Based from the quote from Arch. Palafox that Reclamation is a solution to Metro flooding. In the year 1982, the residents of Don Carlos were not experience flooding. Now that there is a Reclamation Development, we are experiencing flood (Waist level). What more with the Proposed Reclamation.	**Carmensita Macaraeg- Ministry of Ecology**	Arch. Jun Palafox and Arch. Alcarazen respected urban planners were quoted. Blocked esteros and garbage are the main causes of flooding. This is the reason we have extensive dredging projects and esteros cleaning. Moreover, Informal settlers blocking the waterways (ex. Tripa de Gallina) are being move to Cavite to solve flooding in the area. Concern duly noted.	Flooding discussed in **Section 2.2** and **Section 3.**
	Based on a study degradation of mountains and reclamation are the true causes of flooding in Metro Manila not the settlers living in the *esteros.*	**Godson Escopete- Defend Manila Bay**	Duly noted. Will be addressed in the EIS.	Not applicable to the proposed project
	Concerns for traffic.	**Godson Escopete- Defend Manila Bay**	We are still in the initial stage of public scoping. The EIS System includes two (2) aspects. 1. What are the problems and what are the solutions. 2. What are the effects/impacts and what are the mitigating measures We will show this in this two aspect in our EIS Report, EMB will say if the EIA report is acceptable or not based on the appreciation of the report by the EMB and the Review Committee/resource persons	Traffic discussed in **Section 2.4** and **Section 3.**
	Congestion is not a good reason just to reclaim.		Note: Decongestion is only of the several basis for the project	**Section 2.4** and **Section 3.**

EIA Module	Issues/Suggestions Raised by Stakeholder	Sector or Representative Who Raised the Issue/ Suggestion	Proponent's Response	Page discussed in the EIS
	There is a bird sanctuary that will be affected even though the proposed project is not within the declared protected area. Everything (ecosystem) connected.	**Marley Mendoza**	Duly noted	Discussion on Environmental Critical Area provided in **Section 2.1**
3.Water	Blockage of Libertad Channel (water system or canals)- There is a City ordinance that Libertad channel shall not be blocked Because of the 200 meters, Libertad Channel is blocked	**Councilor** **Bong Tolentino of Pasay City**	No waterways including Libertad Channel will be blocked. A 200 meter easement from the coastline prescribed by the PRA will allow sufficient water circulation. (Flow of water shown in the initial master plan.). This will part of the EIS report.	**Section 2.2 Water**
	Reclamation should be constructed above sea level. Assurance that there will be no flooding in Pasay. How will flooding be mitigated?	**Atty. Sonny Quial**	Duly noted Flooding widely discussed. Will be included in the EIS.	**Section 2.2 Water** and **Section 3.**
	Concern for Libertad Channel overflow.	**Godson Escopete-Defend Manila Bay**	We are still in the initial stage of public scoping. The EIS System includes two (2) aspects. 1. What are the problems and what are the solutions. 2. What are the effects/impacts and what are the mitigating measures We will show this in this two aspect in our EIS Report . EMB will say if the EIA report is acceptable or not based on the appreciation of the report by the EMB and the Review Committee/resource persons	**Section 2.2 Water** and **Section 3.**
	Where is the minimum 200 meter wide waterway between CCP and Proposed 60 hectares reclamation? Starting from the embankment of the existing retaining wall?	**Engr. Rommel Roque-GSIS**	200 meters from the coastline is a guideline is at this time from the PRA and will be subject to further evaluation. .	200 meter buffer shown in **Figure 1.8**.

EIA Module	Issues/Suggestions Raised by Stakeholder	Sector or Representative Who Raised the Issue/ Suggestion	Proponent's Response	Page discussed in the EIS
	200 meters wide waterways. Is this the plan that you submit to the PRA?	**Edward Ong- Sofitel Philippines**	Yes but subject for approval. We have to comply with the PRA. Before the reclamation permit we have to be approved by the EMB. We have to follow their guidelines There are still detailed engineering works to be undertaken.	
4. People	Who will benefit in this reclamation area? Where are the people who will be displaced?	**Sister Bernadeth Casas- Assumption Malibay**	Duly noted. Power point presentation of EIA Consultant showed benefits to the people of the City	**Section 2.4.**
5. Others	Where to get the filling materials; there may not be enough for the project. Environmental degradation such as of mountains in Cavite could result.	**Mrs. Annie Cerdena- Geronimo HOA**	Filling materials to be used is subject to separate approval, and subject to ECC. PRA has to approve the source.. Separate ECC, separate application, separate clearances, separate permitting approvals will be made for the filling materials.	**Section I**.
	Where to get the filling Materials for the Proposed 60 and Proposed 300 hectares?	**Grace Makabale- Save Freedom Island Movement**	Filling materials -not until it we have engineering design and we know what we need, type of material and the volumes needed. For planning purposes we will source the filling materials in San Nicolas Shoal.	**Section I.**

EIA Module	Issues/Suggestions Raised by Stakeholder	Sector or Representative Who Raised the Issue/ Suggestion	Proponent's Response	Page discussed in the EIS
	Based from my research, PRA reiterated the non-approval of Pasay Reclamation.	**Aya-NUIP**	This was clarified that there are five stages of the process to follow for the reclamation permit. As of the moment the proponent is only in step 1. Based from our meeting with Councilor Bong Tolentino, discussions were about choosing our joint venture partner not about the approval of reclamation permit. Application was submitted last November with PRA. According to PRA we should seek DILG legal opinion if we used the correct process. Based from the legal opinion signed by ASEC Panadero last March, the process we follow is correct.	See **Annex 17.**
	How much is the Proposed reclamation project for the Proposed 60 and Proposed 300 hectares. Where to source the funds for the reclamation project. Is it solicited or unsolicited? What category is it now?	**Grace Makabale- Save Freedom Island Movement**	The joint venture partner will spend for the project. NEDA will approve the final shares of the government and the contractor. Proposed Reclamation budget for the Proposed 300 is Php 54.5 billion and Proposed 60 is Php 10.1 billion and still subject for approval by NEDA.	**Section I** Php 53.9 Billion
	Why is the Project stated as "proposed"? Or the project is already done? Who is Proposing? Is it Pasay? Or different developers? The design of the area is against the alignment of energy.	**Sister Bernadeth Casas- Assumption Malibay**	"Proposed" before appropriate approvals, including the ECC have yet to be secured. The City of Pasay is the Proponent. Duly noted. Design to be subject for approval of PRA and NEDA. This will still undergo further study.	Noted in various sections of the EIS particularly **Section I**

EIA Module	Issues/Suggestions Raised by Stakeholder	Sector or Representative Who Raised the Issue/ Suggestion	Proponent's Response	Page discussed in the EIS
	PRA -Reclamation should be looked at as a whole	**Edward Ong- Sofitel Philippines**	PRA has a program for the whole Manila Bay Area. They have reclamation plans. When we submitted our proposed project this will be a compliance with their plan. We are supposedly to comply with Boulevard 2000 Project.	
	Cab the Proposed 60 hectares can go independently?	**Edward Ong- Sofitel Philippines**	Yes, Proposed 60 hectares is separate from the 300 hectares. That is why the Project is titled "Proposed 60 and 300 hectares".	**Section ES**.
	PD 1151 was cited	**Loreto Saturnino- Sta. Clara de Montefalco**	Duly noted	**Section I**

- **Various Consultations and Meetings with the LGUs**

The following separate meetings/consultations were undertaken by the Project Proponent with the LGUs. (Provided in **Annex 2** is the submitted Pre-IEC and Related Activities for the Proposed Project)

Date	LGUs/Stakeholders
23 April 2012	Meeting with the LGU
30 April 2012	Meeting with LGU
20 February 2013	Public Scoping (Proposed 60 hectares)
9 July 2014	Public Scoping (Proposed 360 hectares)
29 May 2013	Key Informant Interview (Proposed 60 hectares)
29 May 2013	Public Perception Survey (Proposed 60 hectares)
11 August 2014	Public Perception Survey (Proposed 360 hectares)

- **Public Hearing**

The summary table of issues and concerns and responses thereto that were raised during the Public Hearing on 23 August 2016 is shown in **Table ES.5.** Further, Public Hearing Report is attached in **Annex 14.**

Table ES.5 Summary Table of Public Hearing Issues/Concerns and Responses Thereto

Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City			
Organization	**Issues and Concerns Raised**	**Proponent's Response**	**Page discussed in the EIS**
Ms. Lou Arsenia the Archdiocese Of Manila	1. Sourcing of filling material from San Nicolas Shoal is legally questionable.	The San Nicholas Shoal Dredging Project is presently applying for an ECC; this will resolve question of legality. Other sources of filing materials are available and will be explored.	Page 1-35
	2. According to BFAR there are significant existing fishes and that these can further increase.	Key points are (a) significant fishes (b) survey points in Manila Bay. Slides 36-38 respond to these; Slide 37 shows survey area within the impact zone. Slide 39 shows Aug 20, 2016 fishing survey at the impact zone. (Note: Significant Fishing done outside the project site) Mayor's Speech… "Will neither negatively impact on fisherfolks or damage marine life. Will put up fisherman's whart"	(See **Annex 15**)
	3. DPWH letter denying grant of MGDC LONO	In Mayor's Opening Remarks he cited that in fact DPWH actually issued a LONO. The project on hand is the Pasay Reclamation which is not related to the MGDC Reclamation Project.	(See **Annex 15**)
	4. Other countries may have reclamation but they have been spending money for maintenance.	Maintenance will be regular part of the EMP and will be funded by the Project Developer.	Page 1-58
	5. Flooding, liquefaction, traffic etc., are not perception, these are realities	Project has not been implemented yet, "perception" used as a term to connote "impact" which is a basic aspect of an EIS. "Realities" cannot be attached to an activity / Project that	Page 2-2.3

Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City			
Organization	**Issues and Concerns Raised**	**Proponent's Response**	**Page discussed in the EIS**
		does not exist. Response	
	6. Continuing Mandamus on Manila Bay	Not applicable for a project which is not yet implemented. No mandamus or compelling action at this stage of the Project.	Page 2-1.15
	7. Precautionary Principle	Briefly explained during the Public Hearing	Page 2-1.24
	8. Tourism--- People can go to environmental friendly areas not commercial areas as envisioned.	Mayor cited tourism related project aspects: public parks, recreation centers.. etc.	**Annex 14**
Atty. Galad Pe Benito Consultant of Arch. Of Manila	9. The Project is the City of Pasay **only**. The EMB required the proponent for a single EIS. The project is piecemeal approach. Why not programmatic EIS, the impacts will be different compared to piecemeal approach:	**Engr. Espie Sajul:** Yes, Single EIS Only, although options for Programmatic EIS are available. The proposed project applied for is only for reclamation. **EIA Consultant:** In the EIS only one proponent will stand and apply for the proposed project. The proponent is accountable and responsible. **Prof Gerry:** We the REVCOM, know what project EIS classification should be recommended. The existing law in the EIS is *"bulok"* (rotten). What can we do is follow the existing law although*"may kakulangan ang dating batas."* Hence there are IRR guidelines. (The EIA Consultant explained that they are complying strictly with the Revised Procedural Manual and showed	No need to explain in the EIS Report

Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City			
Organization	**Issues and Concerns Raised**	**Proponent's Response**	**Page discussed in the EIS**
		to the Public a copy of this)	
	10. The proposed project in the EIS is mixed use but the project is for reclamation.	Presentation clearly stated project covers only creation of reclaimed land also showed major components; support facilities and Preliminary Master Plan	**Section 1.4**
Mr. Garcia Sy Associated with Save our Shore Movement	11. Traffic congestion; the Project will not solve traffic congestion.	Clarified as follows: EIS calls for impacts and mitigation; traffic is an impact of the project for which mitigation measures are identified. The Project was never intended to be a solution to the traffic problem in Manila; discussed in the presentation.	**Section 2.4.7** Traffic Congestion
	12. The proponent can provide jobs in other area in the Philippines. The stated number of employees to be hired will contribute to traffic congestion.	Reclamation project may bring problem to traffic congestion but there are mitigation measures. It may also be noted that if the 2,100,000 Employees would be located on shore, i.e. in a no reclamation project scenario, traffic congestion may even be worse. Proponent is not allowed to undertake projects in other areas in the Phl.	**Section 2.4.7** Traffic Congestion
Ms. Lou Arsenia Archdiocese Of Manila	13. Fishermen who fishes along Manila Bay up to Paranaque are said to be prohibited to fish because of reclamation. *"Tinataboy ang mga mangingisda na mangisda dahil sa reclamation"*	Noted. (This refers to another project not the Pasay Reclamation Project).	Page 2-2.116

Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City			
Organization	**Issues and Concerns Raised**	**Proponent's Response**	**Page discussed in the EIS**
Ms. Arlene Tengonciang Save our shores (Geologist)	14. Risks on • Land Subsidence • Flooding--- Reclamation will result to provide water into the bay to come up into the shore • Storm Surge	Responded already in the Presentation of EIA Consultant Mayor noted that President Obama and other Head of States stayed at the existing Reclaimed Area facilities. Discussed in Presentation. Photo of APEC leaders in Reclamation area shown to show lack of serious concern on natural hazards	Section 2.1.2.4 discusses subsidence Flooding Discussed In **Section 2.2.1.1.1** **Sec 2.1.2.4.5** Storm Surge Page 2-1.55
	15. Issues on Ruby Tower	Main cause of Tower collapse was faulty design and construction. No clear cut evidence of liquefaction; this phenomenon was studied in details after the Alaska and Niigata 1961 experience (few years before the Ruby Tower) disaster Slide 55. Further explanation in **Note 15.**	Page 2.1-49
	16. Maybe there are other solutions beside reclamation that can improve the water quality of Manila Bay to increase fishes.	Noted. The PEISS requires impacts and mitigation for a particular project. (The project on hand is reclamation and thus impacts and mitigations should refer to this particular and not to other types of project. Water quality impact is a result of the project NOT the objective)	Noted

Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City			
Organization	**Issues and Concerns Raised**	**Proponent's Response**	**Page discussed in the EIS**
Archdiocese of Manila	17. Who will spend the proposed project? Clarification raised on who the partner of the City is.	This is a project of the City Government of Pasay. No joint venture agreement with Ayala. The City will not spend for the Project	Noted
Ms. Lou Arsenia Archdiocese Of Manila	18. The church built within the reclamation area is currently experiencing problems and needs rehabilitation because water from the sea is reaching the area.	Noted. When the Project materializes; the City of Pasay will include in their SDPs assistances to the church.	**Section 5** SDP
Mrs. Hailey Saturnino Representative of Parish Church and Resident of Pasay	19. Continuing Mandamus on Manila Bay 20. Presidential Proclamation No 41 of President Magsaysay	Refer to Item 6 above The areas covered by this Proclamation do not conflict with the Project as shown in the Presentation. S	Page 2- 15 & **Annex 4** Page 2-23 & **Annex 1**
	21. NIPAS Ac	Post PH. Project not within the NIPAS; explained in the EIS Report. Mentioned during the Public Hearing	**Sec 2.1.1.2** Encroachment in Environmentally Critical Areas Page 2-1.17
	22. Flooding in Pasay	Discussed in Presentation	Flooding Discussed In **Section 2.2.1.1.1**

Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City			
Organization	**Issues and Concerns Raised**	**Proponent's Response**	**Page discussed in the EIS**
Mr. Narod Eco- Save our Shores	23. The Reclamation Platform will not solve storm surges and instead only divert storm surge flows to other part of the City.	Measures including the platform itself and wave deflectors are intended to mitigate storm surges. The reclamation structure will dissipate the wave energy from the storm surge. With or without a reclamation storm surges may occur Slides 64 – 67.	
Ms. Arlene Tengonciang Save our shores (Geologist)	24. Land Subsidence Observed in Metro Manila 25. The created land will subside. 26. Storm Surges will Only Divert the surge to other parts of the Bay/Shore	Acknowledged but subsidence is due to ground water extraction. There will be none associated with the Project. Slide 59. The image of the land subsidence shows this outside of the site. **See Note 24.** Proven dredging technology by experience contractor will be adopted. Land form created will be stabilized prior to vertical construction. Monitoring for subsidence will be made. Reclamation Projects provide sheltering effects from storm surges and are better engineering solution than placing sand bags atop sea walls (Slide 66) Even if the surge is diverted its wave energy would have been dissipated after striking the reclamation walls.	**Section 2.1.2.4.1** Page 2.1.41 Page 2.1-45

Note: The Slides referred to in the last column pertains to the Power Point Presentation during the Public Hearing; shown in **Annex 14.**

ES.3. Summary of Baseline Characterization Key Environmental Impacts and Management & Monitoring Plan and EMF & EGF Commitment

Considering that (a) there are no societal risks (b) the site is not populated and (c) the activities involved are dredging and reclamation an amount of Php 2.5 M as EGF trust fund and Php 1.0M Trust Fund are proposed for discussions with the MMT upon its formation. The summary matrix of the baseline characterization is shown in **Table ES.6.**

Table ES.6 Summary Matrix of the Key Baseline Characterization

Environmental Resource	Module	Characteristics
Land	Land Use and Classification	Consistent with the existing Land Use Classification of the City; Site not in National Integrated Protected Areas System (NIPAS).
	Slope / Elevation	Insignificant because the project is water and not land based. Adjacent shore line and access roads are on developed land without slope or elevation concerns
	Seismicity	Site is approximately 8.71716kms from West Valley Fault and 204kms from Manila Trench; Is located at liquefaction-prone areas. Several high-rise buildings under construction or recently constructed in the existing reclaimed land.
	Terrestrial Flora	Terrestrial ecology is not relevant not only because the project is located at sea but in absence of important species in shore near site
	Terrestrial Fauna	
Water	Drainage System	The Libertad Channel which is the main open drainage system for the City, although adjacent to the site is not disturbed by the project and is outside the site of construction or reclamation works.
	Possible impacts of the project on the occurrence of flooding	Storm water drainage system outside of project site. Pathway of Ondoy floodwaters not towards the project site
	Change in stream, lake water depth	The fresh water bodies relatively nearest the site are at distant locations (e.g. Pasig River, Paranaque River, Laguna Lake) No waste water discharges to these water bodies
	Oceanography	Reclamation of 0.036 Cu. Km. small compared to Manila Bay volume of 9,880,013 Cu. Km. Current at low tide generally northward Bathymetry is between 0.10 to 20.68 at DIA.
	Freshwater Ecology	Insignificant since no freshwater bodies (rivers, creeks, springs) at the reclamation site and neither are there freshwater bodies impacted or disturbed by the project
	Marine Ecology	Absence in Direct Impact Area of significant benthic community of corals, seagrass communities, natural or man-made fish shelters or artificial reefs, as well as occurrence of macro-invertebrates and macro-algae and mangroves. Absence of significant fishery resources in the Direct Impact Area. Site not in Marine Protected Area
Air/Noise	Ambient air/noise quality	Compliant to DENR Standards
People	Demography	Absence of Settlers in Direct Impact Areas

Environmental Resource	Module	Characteristics
	Impact on Commercial Establishments	Presence of commercial establishments near the project site

ES.3.1 Key Environmental Impacts and Mitigating Measures

These are summarized in **Table ES.7.**

ES.3.2 Environmental Monitoring Plan (EMoP)

This is summarized in **Table ES.8.**

Table ES.7 IMPACT MANAGEMENT PLAN (IMP)

Project Phase / Environmental Aspect (Project Activity Which Will Likely Impact the Environmental Component)	Environmental Component Likely to be Affected	Potential Impact	Options for Prevention or Mitigation* or Enhancement	Responsible Entity	Cost	Guarantee / Financial Arrangements
I. PRE-CONSTRUCTION PHASE	**Not Relevant No Impacts during this Phase. No activities at reclamation site except survey works.**					
II. CONSTRUCTION PHASE						
Environmental Aspect # 1	A. The Land	Perception of Flooding On Shore as a result of reclamation	Reclamation itself provides protection against storm surges and thus against floods.	Not Applicable	Not Applicable	Not Applicable
			Flood water pathways in Pasay is **NOT** directed towards the project area, (Per the NOAH Project)	Not Applicable	Not Applicable	Not Applicable
		Ground shaking and liquefaction	Engineering intervention: structural and engineering designs to withstand earthquakes and liquefaction.	Engineering Consultants	Incl. in master plan cost	Not Applicable
			Phil. Standards	Engineering Consultants	Incl. in master plan cost	Not Applicable
		Disturbance of flora and fauna	Avoidance of disturbance of habitat and bird food	Reclamation Contractor	Part of project Cost	Not Applicable
		Mangroves absent at the project site	Masterplan will consider feasibility of enhancement of habitats, including growing of mangroves near site	Reclamation Contractor	Part of project Cost	Not Applicable
		Exotic and rare bird species sighted hovering over the site and immediate vicinity.		Reclamation Contractor	Part of project Cost	Not Applicable
		Damage to roads	Avoidance/Location of access roadways	Reclamation Contractor	Part of project Cost	Not Applicable
		Incl. Diversions of access points		Reclamation Contractor	Part of project Cost	Not Applicable

Project Phase / Environmental Aspect (Project Activity Which Will Likely Impact the Environmental Component)	**Environmental Component Likely to be Affected**	**Potential Impact**	**Options for Prevention or Mitigation* or Enhancement**	**Responsible Entity**	**Cost**	**Guarantee / Financial Arrangements**
Environmental Aspect # 2	B. The Water-Manila Bay No rivers, creeks, lakes at site	Permanent loss of Manila Bay water equivalent to 360 has.	Irreversible. Comply with PRA Notice to Proceed. Creation of equivalent water volume at the San Nicholas Shoal	Proponent/ Contractor	Part of project cost	Contract with PRA
		Silt dispersal to Bay due to dredging/filling operations	Silt curtains/containment at perimeters	Proponent/ Contractor	Part of contract	EIA Commitment
		Turbidity Increase	Dredging/filling methodology; Stockpiling of earth fill shall be placed away from water bodies and covered with suitable material during rainy season	Proponent/ Contractor	Filling materials sourcing not in scope of EIA	ECC or applicable regulations MMT
		Potential contamination with substances in filling materials	Pre-screening of filling materials; possible sourcing from Manila Bay	Proponent/ Contractor	Part of contract	ECC commitment MMT
			Observe project boundaries	Proponent/ Contractor	Part of contract	ECC commitment MMT
	Libertad Drainage Channel	Domestic wastes from construction crew and possible hazardous waste material accidental spillage	Appropriate toilet facilities	Proponent/ Contractor	Part of contract	ECC commitment MMT
			Oil and lubricants (used or spent) should be collected and treated by TSD facility	Proponent/ Contractor	Part of contract	ECC commitment MMT
	Manila Bay	Not disturbed by the Project	Insignificant ecologically important marine life	Proponent/ Contractor	Part of contract	ECC commitment MMT
		Potential damage to marine life		Proponent/ Contractor	Part of contract	ECC commitment MMT
			Containment wall	Proponent/ Contractor	Part of contract	ECC commitment MMT
	C. The Air	Noise	Temporary-construction - short time only	Contractor	Part of contract	MMT

Project Phase / Environmental Aspect (Project Activity Which Will Likely Impact the Environmental Component)	**Environmental Component Likely to be Affected**	**Potential Impact**	**Options for Prevention or Mitigation* or Enhancement**	**Responsible Entity**	**Cost**	**Guarantee / Financial Arrangements**
Environmental Aspect # 3		Emissions if power generating sets used and fossil fuel using equipment	Use of quality fuel	Contractor	Part of contract	MMT
			Proper maintenance of gensets	Contractor	Part of contract	MMT
Environmental Aspect #4	D. The People	Essentially none-no settlers to be displaced because the area is uninhabited	Enhancement	Proponent	Not Applicable	MMT
		Livelihood and employment opportunity	Enhancement	Proponent	Not Applicable	MMT
OPERATIONS PHASE	**THIS PHASE IS OUTSIDE THE COVERAGE OF THE RECLAMATION WORKS-For Reference Purpose Only**					
Environmental Aspect # 1	I. The Land ("Land" refers to the original on shore land not to the reclaimed land")	Traffic density increased	Traffic Management	In coordination with MMDA and LGU	To be included in operating cost	Not applicable
			Internal circulation within the reclaimed land	In coordination with MMDA and LGU	To be included in operating cost	Not applicable
Environmental Aspect # 2	II. The Water	Generation of domestic wastes	Individual and centralized treating system(s)	Proponent	Part of Project cost	EIA Commitments
		Damage to Marine Water And Species		Proponent	Part of Project cost	EIA Commitments
Environmental Aspect # 3	III. The Air	Air pollution from vehicles	Traffic Management Quality motor fuels	Proponent	Not applicable	RA 8749
Environmental Aspect # 4	IV. The People	Enhancement	SDP / IEC	Proponent	Part of Project Cost	ECC Conditions and commitments in the EIS
	Migration/In migration		Preferential hiring of qualified residents	Proponent	Per agreement with affected sectors	Separate agreements reached
	Livelihood and Employment			Proponent	Not applicable	Agreement w affected sectors

Project Phase / Environmental Aspect (Project Activity Which Will Likely Impact the Environmental Component)	**Environmental Component Likely to be Affected**	**Potential Impact**	**Options for Prevention or Mitigation* or Enhancement**	**Responsible Entity**	**Cost**	**Guarantee / Financial Arrangements**
	Health		Same as in air module			SDP
IV. ABANDONMENT PHASE	**THE PLANS FOR REHABILITATION, ABANDONMENT AND DECOMMISSIONING WILL NECESSARILY BE COMMUNICATED WITH THE DENR/EMB FOR THE LATTER'S REQUIREMENTS AND APPROVAL**					
Environmental Aspect # 3	A. The Air	Not Relevant	Not Relevant	N/A	N/A	N/A
Environmental Aspect # 4	B. The People	Loss of employment	Payment of Social benefits			DOLE Rules on Labor Standards

Table ES.8 Monitoring Plan (EMoP) with Environmental Quality Performance Levels (EQPLs)
Summary of the EMoP for the Reclamation Phase

Key Environmental Aspects per Project Phase	Potential Impacts Per Envit'l Sector	Parameter to be Monitored	Sampling & Measurement Plan			Lead Person	Annual Estimated Cost	EQPL MANAGEMENT SCHEME					
			Method	Frequency	Location			EQPL RANGE			MANAGEMENT MEASURE		
								ALERT	ACTION	LIMIT	ALERT	ACTION	LIMIT
I. PRE-CONSTRUCTION PHASE	**Not Applicable**												
II.CONSTRUCTION PHASE													
Environmental Aspect #1 Air	Ambient Air Quality	TSP	1 – Hour Gas Bubbler GriessSultzman High Volume Sampler / Gravimertic(USE PA method5)	Semi Annually	Downwind at nearest existing establishments or buildings	Project Manager	Php 100,000	Of minor significance because of absence of air pollution generators and because construction activities will be undertaken at sea and not at land.					
Environmental Aspect #1 Air	Ambient Air Quality	Noise	Meter	Daily	Same as above	Project Manager	Nil	Of minor significance because of absence of air pollution generators and because construction activities will be undertaken at sea and not at land.					
Environmental Aspect #2 Land	Terrestrial	Considered as Nil or not significant. There are no Terrestrial (Floral) resources.											
	Solid Wastes	Not relevant. Activities will be on sea. Solid wastes during construction or dredging will consist of unwanted sea bed materials which will be disposed at an area within the Manila Bay or on shore Activities on land will be during the stabilization of the reclaimed land and will not involve major work except settling and compaction of the reclaimed land											
Environmental Aspect #3 Water	Water Quality Bay Pollution	BOD_5	Azide Modification-Dilution Technique (USEPA method 3010)	Quarterly	Downstream of specific site of reclamation activities	Project Manager	Php 7000	Not considered relevant because domestic wastes are from construction crews only who are based on barges or sea going vessels					
	Water Quality Bay Pollution	Total Suspended Solids (TSS)	Gravimetric (Dried at 103-105° C) (USEPA method	Quarterly	Downstream of specific site of reclamation	Project Manager	Php 2000	90 % of the prescribed limit	95 % of prescribed limit	At least 100 % prescribe	Inspection of activities	Corrective Actions, e.g. silt	Temporary stoppage until corrections

Key Environmental Aspects per Project Phase	Potential Impacts Per Envit'l Sector	Parameter to be Monitored	Sampling & Measurement Plan			Lead Person	Annual Estimated Cost	EQPL MANAGEMENT SCHEME					
			Method	Frequency	Location			EQPL RANGE			MANAGEMENT MEASURE		
								ALERT	ACTION	LIMIT	ALERT	ACTION	LIMIT
			3010)		activities					d limit		traps	made
	Water Quality Bay Pollution	Color	(USEPA method 3010)	Quarterly	Downstream of specific site of reclamation activities	Project Manager	Php 1000	Not considered significant, no color modifying substances to be discharged					
	Water Quality Bay Pollution	Temperature	Thermometer(USEPA method 3010)	Quarterly	Downstream of specific site of reclamation activities	Project Manager	Nil	Not considered significant, no thermal effects					
	Water Quality Bay Pollution	pH	pH probe (USEPA method 3010)	Quarterly	Downstream of specific site of reclamation activities	Project Manager	Nil	Not considered significant, no acid or bases in effluents					
	Water Quality Bay Pollution	O & G	Std Method	During reclamation works	At strategic points	Project Manager		90 % of prescribed limit	95 % of prescribed limit	At least 100 % of prescribed limit	Inspection of activities for corrective actions	Corrective Actions	Temporary Stoppage
	Water Quality Bay Pollution	Arsenic	SDDC, Spectrophotometric	During reclamation works	At strategic points	Project Manager	Included in the Php 50.000 estimated annual budget for heavy metals parameters	90 % of prescribed limit	95 % of prescribed limit	At least 100 % of prescribed limit	Same as above	Same as above	Same as above
	Water Quality	Chromium	Flame AAS	During reclamatio	At strategic points	Project Manager	Included in the Php 50.000 estimated annual	90 % of prescribed	95 % of prescribe	At least 100 % of prescribe	Inspection of activities for	Corrective Actions	Temporary Stoppage

Key Environmental Aspects per Project Phase	Potential Impacts Per Envit'l Sector	Parameter to be Monitored	Sampling & Measurement Plan			Lead Person	Annual Estimated Cost	EQPL MANAGEMENT SCHEME					
			Method	Frequency	Location			EQPL RANGE			MANAGEMENT MEASURE		
								ALERT	ACTION	LIMIT	ALERT	ACTION	LIMIT
	Bay Pollution			n works			budget for heavy metals parameters	limit	d limit	d limit	corrective actions		
	Water Quality Bay Pollution	Lead	Flame AAS	During reclamation works	At strategic points	Project Manager	Included in the Php 50.000 estimated annual budget for heavy metals parameters	90 % of prescribed limit	95 % of prescribed limit	At least 100 % of prescribed limit	Inspection of activities for corrective actions	Corrective Actions	Temporary Stoppage
	Water Quality Bay Pollution	Mercury	Manual Cold Vapor AAS	During reclamation works	At strategic points	Project Manager	Included in the Php 50.000 estimated annual budget for heavy metals parameters	90 % of prescribed limit	95 % of prescribed limit	At least 100 % of prescribed limit	Inspection of activities for corrective actions Corrective Actions		Temporary Stoppage
	Water Quality Bay Pollution	Marine species	Underwater survey	During reclamation works	Near the site where construction activities, e.g. dredging or filling are conducted	Project Manager	Php 200,000	10 % decrease from the baseline	20 % decrease from the baseline	50 % decrease from the baseline	Inspection of activities Check and monitor the performance of dredging works	Corrective Actions Increase frequency of inspection and monitoring	Temporary Stoppage until corrective measures in place

Key Environmental Aspects per Project Phase	Potential Impacts Per Envit'l Sector	Parameter to be Monitored	Sampling & Measurement Plan			Lead Person	Annual Estimated Cost	EQPL MANAGEMENT SCHEME					
			Method	Frequency	Location			EQPL RANGE			MANAGEMENT MEASURE		
								ALERT	ACTION	LIMIT	ALERT	ACTION	LIMIT
Environmental Aspect # 4 People	Jobs	Employment of local qualified residents	Record of contractors	Entire reclamation period	N.A.	Project Manager	Part of the operation cost	Negative feedback to the Proponent	Formal complaint by the hired workers		Proponent to investigate	Bring Notice of DOLE	Review the operation protocol and reconsider the complain if applicable
	Jobs	Payment of compensation workers	Payment records	Same	N.A.	Proponent	Part of the operation cost	Negative feedback to the Proponent	Formal complaint by the hired workers		Payment of Salaries within the month	Review the operation protocol and reconsider the complain if applicable	Bring Notice of DOLE

The operation phase is not applicable because the project only involves horizontal development and that is the Reclamation Project.

The operations phase will be subject to separate and relevant laws governing the PEISS.

DUE PROCESS IS A REQUIREMENT OF GOOD GOVERNANCE

e Department of Environment and Natural Resources presents its position on the mining project in Mindoro as gards the following issues raised in an earlier paid advertisement in this paper and subject also of an on-going demonstration in front of DENR premises:

recognition of the LGUs' moratorium on mining.

- The DENR recognizes the moratorium, but this is a separate issue. Based on PD1586, the DENR, through the ECC, is mandated to assess the environmental impacts of an environmentally-critical project and prescribe mitigating measures to address these pre-identified impacts, regardless of any existing moratorium.

  The DENR stresses: (a) ECC is a planning tool, not a permit. It is supposed to guide the LGUs and other concerned agencies in the issuance of their permits; and (b) The LGU is responsible for upholding the local moratorium.

failure of Intex Resources to conduct genuine consultations in the affected communities.

- DENR officials claim that they conducted public hearings in the municipalities of Pola and Mamburao, while Intex Resources conducted consultations and public scoping sessions in the areas of Calapan, San Teodoro, Victoria, Pola, and Sablayan, where the affected communities are located. These consultations/hearings were conducted to generate environmental concerns of the community, not social acceptability.

steadfast refusal of LGUs to allow the entry of Intex Resources in the areas.

Project Name	:	**Proposed Pasay City Reclamation Project**
Project Location	:	**Along the Coast of Pasay City**
ECC Reference No.	:	**None yet**
Proponent	:	**Local Government of Pasay City**
Pollution Control Officer	:	
Tel. No./Fax No./Email	:	**((02) 833-3729**
Project Type	:	**Environmentally Critical Project in a Environmentally Critical Area (ECP in an ECA)**
Project Status	:	**Pre-construction**

I. PROJECT CONSIDERATIONS

1.1 Size and Type

1.1.1 Size based on number of employees (construction workers)

Specify number of employees: _____

1.1.2 Type

ECP in Non-ECA	
ECP in ECA	/
Non-ECP but in ECA	
Non-ECP and Non-ECA	

1.2 Waste Generation and Management

1.2.1 Enumerate Waste Type and Specify Quantity of Wastes generated in your facility. (Identify /Enumerate)

Category	Waste	Type		Quantity
		Hazardous	Non-Hazardous	
Air	None			
Liquid	None			
Solid	Silt	No	Yes	TBD-dredged materials

For purposes of the PEMAPS which is “predictive” in nature, the minor and variable quantities of hazardous wastes are not reported, e.g. discarded lighting bulbs, spent computer inks, etc. These are generated in small volumes during the reclamation/construction phase.

Wastes during the Operations Phase not included, Operations Phase subject to separate environmental evaluation.

1.3 Pollution Control System (PCS)

1.3.1 Enumerate PCS or Waste Management Method Used in your facility. (Identify /Enumerate)

Category	PCS/Waste Management Method Used	Remarks
Air	Not applicable	
Liquid	Domestic Waste-Temporary Toilet Facilities	Construction Work

Solid	Silt/dredged materias-disposal in another area of the Bay	

II. PATHWAYS

2.1 Prevailing wind towards barrio or city? (mark the corresponding point) Yes ____ No _ ___

Not applicable

2.2 Rainfall (impacts surface & groundwater pathways) N/A

Not applicable

2.2.1 Average annual net rainfall:

Specify amount: (units: mm)

2.2.2 Maximum 24-hour rainfall:

Specify amount: (units: mm)

2.3 Terrain (select one and mark) Flat ____ Steep ____
Not applicable

2.4 Is the facility located in a flood-prone area? (select one and mark) Yes ____ No _/___.

2.5 Ground Water N/A

Depth of groundwater table (meter) (select one and mark)

0 to less than 3 _____
3 to 10 _____
Greater than 10 _____

III. RECEIVING MEDIA/RECEPTORS

3.1 Air (Distance to nearest community) (select one and mark)

0 to less than 0.5 km ./_____
0.5 to 1 km _____
Greater than 1 km _____

3.2 Receiving Surface Water Body

3.2.1 Distance to receiving surface water: (select one and mark)

0 to less than 0.5 km _____
0.5 to 1 km _____
Greater than 1 km /_____

3.2.2 Size of population using receiving surface water

Specify number: Not Applicable

3.2.3 Fresh Water N/A

3.2.3.1 Classification of fresh water (select one and mark)NA

AA _____
A _____
B _____
C _____
D _____

3.2.3.2 Size of fresh water body N/A

Specify size: (units: km^2)

3.2.3.3 Economic value of water use (may select more than one of the criteria below)

Drinking	
Domestic	
Recreational	
Fishery	
Industrial	
Agricultural	

3.2.4 Salt water

3.2.4.1 Classification of salt water (select one and mark)

SA	
SB	/
SC	
SD	

3.2.4.2 Economic value of water use (may select more than one of the criteria below)

Fishery	/
Tourist zone or park	/
Recreational	/
Industrial	No

3.3 Ground Water NA

3.3.1 Distance to nearest recharge area (select one and mark)

0 to less than 0.5 km	
0.5 to 1 km	
Greater than 1 km	

3.3.2 Distance to nearest well used N/A

0 to less than 0.5 km	
0.5 to 1 km	
Greater than 1 km	

3.3.3 Groundwater use within the nearest well (may select more than one of the criteria below)

Drinking	
Industrial	
Agricultural	

3.4 Land NA Project is Water based

3.4.1 Indicate current/actual land uses within 0.5 km radius: (may select more than one of the criteria below)

Residential	
Commercial/Institutional	
Industrial	
Agricultural/Recreational	
Protected Area	

3.4.2 Potential/proposed land uses within 0.5 km (may select more than one of the criteria below)

Residential	
Commercial/Institutional	
Industrial	
Agricultural/Recreational	
Protected Area	

3.4.3 Number of affected Environmentally Critical Areas within 1 km:

Specify number: Nil

3.4.4 Distance to nearest ECA

0 to less than 0.5km /
0.5 to 1 km
Greater than 1 km

IV. ENVIRONMENTAL PERFORMANCE – Original Project Still Under construction

3.5 Compliance (pls. take note that this will be double-checked with PCD files) N.A.

Law	Violation (check if any)	Type (pls. specify number of times committed)				Type of Admin Violation	Additional Remarks/Status of Compliance
		STANDARD					
		Emission/Effluent/ Discharge	Ambient	Human Impact	Admin/ ECC		
RA 8749							
RA 9275							
RA 6969							
PD 1586							
RA 9003							

3.6 Number of Valid Complaints

3.6.1 Citizen and NGOs

Specify number:

3.6.2 Others (other Govt. Agencies, Private Institutions)
Specify number:

(To be filled up by EMB Personnel)

RECOMMENDATION/S:

Assessed By:

Noted By:

ACCOUNTABILITY STATEMENT OF PROJECT PROPONENT

This is to certify that all information in the submitted **Project Environmental Monitoring and Audit Prioritization Scheme (PEMAPS) Questionnaire for the Proposed 300 Hectares Reclamation Project** of the Local Government of Pasay City located along the coast of Manila Bay, Pasay City is true, accurate and complete. Should I shall bring said information to the appropriate Environmental Management Bureau Regional Office.

In witness whereof, I hereby set out my hands this 23 OCT 2014 day of 2014 at [illegible].

ANTONINO G. CALIXTO
City Mayor
Pasay City

SUBSCRIBED AND SWORN TO before me this _____ day of _____ 2014, affiant exhibiting his/her Community Tax Certificate No. _____ issued at _____ on _____.

Doc. No. 122
Page No. 25
Book No. XXV
Series of 2014

ATTY. FRANCISCO P. TAALA
Notary Public
[illegible]
PTR No. [illegible]
IBP No. 73[illegible]
Roll No. [illegible]
MCLE EXEMPT

The existing shoreline at the project site is already developed seen in the photographs below.







SEAWALL ALONG SOFITEL



SEAWALL ALONG THE COCONUT PALACE







Actual fishing operations in the proposed 360-hectare reclamation project (left), a lone Sardine fish caught in Station 3, and fish vendor selling Tilapia allegedly caught one kilometer from the seawalls.

Pictures of reclamation site





View of skyline

The EIA study areas are identified in the discussions of the specific modules, i.e. Land, Water, Air and People









GENERIC ECC APPLICATION SCREENING FORM
(Required an EIS Per Existing Guidelines)

Control No: _____
☐ 1st ☐ 2nd ☐ 3rd ___ th Screening

Date Submitted for Screening: _____
Form of Submission: ___ Hard ___ Digital
Project Title: Proposed 360 Hectares Reclamation Project
Project Location: Along Coast of Manila Bay, City of Pasay
Project Proponent: City of Pasay
Address: Pasay City Hall
Contact No: (02) 833 3729 Contact Person: Atty. Severo Madrona
EIS Consultant: Technotrix Consultancy Services, Inc
Address: 603 FMSG Building, Balete Drive Cor. 3rd St. Q.C. 1101
Contact No: 416 4625 Fax No: _____ Contact Person: Edgardo G. Alabastro, Ph.D.
Project Classification & Type: Major Reclamation Project
Project Classification Code *(Refer to RPM for DAO 2003-30)*: D.1
Project Size based on Classification: >= 50 hectares
Date of Technical Scoping: August 7, 2014
Venue of Technical Scoping: EIA Conference Room

Checklist of Documentary Requirements

	Acceptable?		Screening Officers' Remarks
	Yes	No	
• Environmental Impact Statement (EIS)			
• Proof of Compatibility with the existing Land Use Plan /Operational Plan of Manila Bay Coastal Strategy – Manila Bay Sector of the National Reclamation Plan, Land Use Plan of the City of Pasay Duly Approved by HLURB)			
• Proof of Authority over the Project Site (Area Clearance); Include documents pertaining to LGU resolutions to the project			Check DENR MC in relation to ECC issuances for reclamation projects
• Accountability Statements of Preparers & Proponent (see Annexes 2-21 & 2-22 of Revised Procedural Manual for DAO 2003-30)			
• Photographs or plates of the project site, impact areas and affected areas and communities			
• Duly Accomplished Project Environmental Monitoring & Audit Prioritization Scheme (PEMAPS) Questionnaire (see Annex 2-7d of Revised Procedural Manual for DAO 2003-30)			

ACTION TAKEN: (Please check to indicate corresponding action taken)

☐ Document accepted; please submit ___ copies
EIARC Needed? ( ) Yes ( ) No Expertise Needed: _____
Processing Fee: PhP _____ *(Pay at EMB Cashier)* Review Fund: Based on WFP *(Pay to the duly authorized 3rd Party Review Fund Manager)*

☐ Document not accepted

O.R. # _____
Date _____

NOTED BY:

_____
Screening Officer

_____
Section/Division Chief

EMB Central Office
Screening Office

Date: _____

GENERIC ECC APPLICATION SCREENING FORM
(Required an EIS Per Existing Guidelines)

Control No: _____
☐ 1st ☐ 2nd ☐ 3rd ___ th Screening

Checklist of EIS Contents

Executive Summary

Contents	Page #	Acceptable?	REMARKS
Project Fact Sheet / PD Summary			
Process Documentation of the conduct of EIA *(EIA Team, EIA Study Schedule & Area, EIA Methodology, Public Participation)*			
Summary of Baseline Characterization Key Environmental Impacts and Management & Monitoring Plan and EMP & EGF Commitments.			

Project Description

Items to be Described	Specific Data Requirement	Page #	Acceptable?	REMARKS
1) Project Location and Area	a) Map showing site, barangay, municipality, province, region boundaries, vicinity, proposed buffers surrounding the area and Primary & secondary impact areas			Include existing reclamation projects. Also include PRA targets and linked projects (ex. San Nicholas Shoal Dredging Project)
	b) Geographic coordinates (shape file data) of project area (use WGS 84 datum - GPS setting)			
	c) Rationale for selection primary & secondary impact areas			Segregate primary and secondary impact area for bio physical from social impact areas (tabulate and mapped out)
	d) Discuss the accessibility of the project site/area			
2) Project Rationale	• Cite and focus on the need for the project based on national and regional/local economic development in terms of contribution to sustainable development agenda or current development thrusts. • Describe the justification for the Project with particular reference made to the economic and social benefits, including employment and associate economic development, which the project may provide. The status of the project should be discussed in a regional and national context.			Discussion should be consistent with the other plans (compatible with **(a) PRA implementing rules and regulations, (b) DENR Manila Bay Coastal Strategy and its Operational Plan, (c) Pasay City CLUP rules and regulations, (d) Continuing Supreme Court Mandamus on Manila Bay, (e) PRA Boulevard 2000 Integrated Framework Plan)** pertaining to reclamation
3) Project Alternatives	a) Cite criteria used in determining preliminary options for facility siting, development design, process/technology selection, resource utilization including discussion of the consequences of not proceeding with the project: • Contextualize site selection in terms of			Please tabulate options considered

GENERIC ECC APPLICATION SCREENING FORM
(Required an EIS Per Existing Guidelines)

Control No: _____
☐ 1st ☐2nd ☐3rd ___ th Screening

Items to be Described	Specific Data Requirement	Page #	Accessible?	REMARKS
	conditions (data can be obtained from NDRRMC and NAMRIA as well as other mandated agencies) • Discuss the alternatives (type and location) considered and nominated during the course of selecting the best option for which the EIS is prepared; • Description of the bases upon which the alternatives were rejected in favor of the preferred option. • Description of the significant differences in environmental impacts among the alternatives considered. Siting: Alternative project locations including factors significant to the selection such as perception of affected communities with regards to project, ancestral domain issues, land classification, etc. Discuss other options on the siting of major components of the project within the project area. Technology Selection/Operation Processes: Discuss project's advantage over alternative technologies, operation processes and engineering design ~~Discuss alternative measures for the prevention of the occurrence of major impacts~~ Discuss alternative measures for the prevention of the occurrence of major impacts (eg. air and water pollution, possible groundwater and land contamination, industrial accidents/risks such as fire and explosion, oil spillage, noise, odor etc.) Resources: Discuss the alternatives considered in the course of selecting the resources to be tapped and how the decisions were made in favor of the preferred resource. Include discussions on power and water sources. Discussions should also be in the context of climate change, if applicable.			
	b) Reasons for selecting the preferred options delineated in terms of technical, commercial, social and natural environmental aspects			
	c.) After the determination, please indicate a summary of the comparative environmental impacts of each alternative			
4) Project Components	• Identification of Major components including technical details such as specifications, size (e.g. length, width), capacity, number, etc. ~~including the cooling water system~~ • **Specify the operations and process *(from sourcing to construction operation)*** • ***Include drainage as project component***			Tabulate components together with specifications and areas. Specifications should be based on the projection of estimated number of locators and number of population capacity.
	• Identification of other Support Facilities • Identification of materials/product handling facilities, infrastructure requirements (transport—road/rail/ship, power, water supply and storage, storm water drainage, Sewerage, Telecommunications, accommodation and other infrastructure).			
	• Identification of pollution control devices including other waste management and corresponding facility being served or connected • Identification of safety devices/ emergency facilities to be used in the occurrence of industrial accidents/emergencies (ie. fire, explosion, accidental chemical/oil spillage etc.)			
	• General layout of facilities. • Footprint of proposed layout of project facilities • Maps also to be provided showing the precise location of the			

GENERIC ECC APPLICATION SCREENING FORM
(Required an EIS Per Existing Guidelines)

Control No:
☐ 1st ☐2nd ☐3rd ___ th Screening

Items to be Described	Specific Data Requirement	Page #	Acceptable?	REMARKS
	and location of all proposed buffers. • Contextualize using the PAG-ASA 2020 and 2050 projected rainfall/temperature data			
5) Process/ Technology	Technology Description and/or Performance/Design Specifications Include flow-sheets/diagrams for the operations and the anticipated rates of inputs, wastes and recycle streams			Include description of construction activities (horizontal development)
	Power & water supply system			
	Waste Management Systems such as wastewater treatment facility (WTF) / Sewage Treatment Plant (STF), air pollution control devices, Materials Recovery Facility (MRF) etc. Safety/ emergency/ decontamination procedures and management, if applicable.			
6) Project Size	Total capacity / stock population/dimension (whichever is applicable)			
	Total Project Area in sqm. or hectares			
7) Development Plan, Description of Project Phases and Corresponding Timeframes	Phases to be described in terms identifying specific activities (w/ special attention on those with significant environmental impacts as well as climate change adaptation options relevant to the project and project activities) and corresponding projected implementation timeframes: • ***Pre-construction*** (e.g. planning, acquisition of rights to use land, etc.) • ***Construction*** (e.g. land/site clearing, temporary housing, transport of materials, health and other services for the workforce) • ***Operation*** (projected period of start-up/commissioning/full operation of various project components) include discussion on the operation of various components (as identified above) in terms of raw materials and fuel requirements, infrastructure requirements (transport—road/rail/ship, power, water supply and storage, storm water drainage, sewerage, telecommunications, accommodation and other infrastructure), waste management (characteristics and quantities of waste materials, wastewater, air emissions, solid wastes - toxic and hazardous, non toxic and non hazardous) • ***Abandonment*** Final Rehabilitation/ Decommissioning Plan, to include Land/soil restoration, decontamination or remediation activities and procedures & projected schedule. Should discussions about strategies and methods for final rehabilitation of the environment disturbed by the project. The land use suitability of the various land disturbance types should also be described. The proposed decommissioning plan in terms of the following: • Procedures for the decommissioning of the project components; • Transport/disposal of equipment and other materials used in the plant's operation; • Remediation of contaminated soil and water resources due to spills and leakage of chemicals and other materials used in the operation; • Alternatives for the future use of abandoned area; • Consistency with long term zoning and land use development plan of the municipality; • Rehabilitation/ restoration plans, if any			
8) Manpower	Tabulate the following: **pre-construction, construction, post-horizontal construction phase(for management and maintenance activities), abandonment phase:** • manpower requirements; • expertise/skills needed; • nature & estimated number of jobs available for men, women, and indigenous peoples (if sited in IP ancestral land); • preferred scheme for sourcing locally from host and neighboring LGUs			
9) Indicative Project Investment Cost (Philippine Peso)				

Control No. _____
☐ 1st ☐ 2nd ☐ 3rd ____ th Screening

General Contents	Specific Content Requirement	Page #	Acceptable?	REMARKS
II. Key Environmental Impacts and Management/Monitoring Plan	See attached checklist of contents When applicable include appropriate climate change adaptation measures/options (embedded in each sector). ***Use the impacts in the screening forms as the title of the sub-sections under the main sections (land, air, water, people).***			
III. Impact Management Plan	Limit to most significant impacts per project phase and per environmental component arising from key environmental aspects (See Annex 2-17 of RPM for DAO 2003-30)			
IV. Social Development Plan/Framework (SDP) and IEC Framework	SDP • Community development or livelihood programs/activities, projected beneficiaries, partner institutions, timeframe of implementation as well as source and amount allotted per activity/component (See Annex 2-18 of RPM for DAO 2003-30)			
	IEC Target sector, key messages, scheme/strategy/methods, information medium, timelines and frequency, cost (See Annex 2-19 of RPM for DAO 2003-30) ***IEC should highlight among others the new nature of the project.***			
V. Environmental Compliance Monitoring	Self Monitoring Plan Use Annex 2-20 of RPM for DAO 2003-30 as template			
	Multi-Sectoral Monitoring Framework / • Tabulate the list of stakeholder-members of the MMT, basis of selection, proposed role, and scope of MMT responsibilities and activities, etc. (See Annex 3-4 of the RPM for DAO 2003-30)			
	Environmental Guarantee and Monitoring Fund Commitments • Present a propose amount of EMF (based on a draft AWFP in Annex 3-4 and consistent with guidelines in Annex 3-5 of RPM for DAO 2003-30); and • Present a proposed amount of EGF and the basis for the estimate following the guidelines in annex 3-6 of RPM for DAO 2003-30			
VI. Emergency Response Policy and Generic Guidelines	The safety policy and generic guidelines should be consistent with the regulatory requirements. Emergency Preparedness should also consider natural hazards to the infrastructures and facilities. Note: The proponent's final safety/contingency/emergency guidelines (based on safety assessment eg. HAZOP) must be submitted to EMB prior to operation. ***Include disaster risk reduction and climate change adaptation policies and guidelines.***			
VII. Abandonment /Decommissioning /Rehabilitation Policy and	Statement on Proponent's policies and generic procedures for Rehabilitation/ Decommissioning/Abandonment to be submitted post-ECC, within a timeframe specified in the ECC.			
VIII. Institutional Plan for EMP Implementation	Discuss the organizational scheme of the proponent including line of command and reporting procedures as well as manpower complement and relationships with other operating departments, contractors and management of other linked projects. *Include in the discussion, the shared responsibilities and liabilities of linked projects and other relevant entities			

list of EIS Contents
vironmental Impacts and Management/Monitoring Plan

List of Key Impacts	Baseline Data Parameter Requirements	Required Assessment Methodology/Approach	✓ for completeness during procedural screening; page numbers should be provided upon submission of the EIS								Remarks
			Baseline Conditions		Impact Analysis		Mgmt. Plan		Monitoring Plan		
			Page	✓	Page	✓	Page	✓	Page	✓	
g scoping: Unless otherwise specified as agreed during scoping, all items listed are required. Write specific instructions (if any) on the blank spaces provided											
nd											
Land Use and Classification											
Change/Inconsistency in land use	Description & Map showing the project area in relation to existing land use.	Assessment of the compatibility of the proposed project in relation to land use and/or the coastal resource management plan of the LGU if any Assessment should consider consistency with the following plans: (a) PRA implementing rules and regulations, (b) DENR Manila Bay Coastal Strategy and its Operational Plan, (c) Pasay City CLUP rules and regulations, (d) Continuing Supreme Court Mandamus on Manila Bay, (e) PRA Boulevard 2000 Integrated Framework Plan) pertaining to reclamation									
Encroachment in Environmentally Critical Areas (ECAs)	Identify ECA where the project is located or near the project area. Identify areas vulnerable/susceptible to natural hazards where the project is located or near the project area (include map/s)										Focus on the possible conflicts with the nearby cities involving use or access to rivers within the site and vicinity.
Possible tenurial / water issue	Specify other conflicting tenurial/water issues (eg. ROWs, informal settlers etc.)										
Geology/Geomorphology											
Change in surface landform/ raphy/ terrain/slope	Slope and Elevation/Topographic Map;	Include discussion on suitability of fill materials, overall stability of the area being reclaimed to include abatement measures to ensure stability of the new landform and other superstructures.									
Change in sub-surface geology	Regional/General Geological Map										
nducement of subsidence, iquefaction, landslides, mud / debris flow, etc.	Geological Map as needed.; hazard maps (NAMRIA, NDRRMC, MGB, PHIVOLCS, PAG-ASA)	Include discussions on impacts/effects of natural hazard on the project.									
Pedology											
Soil erosion / Loss of il/overburden	Summary of Soil Investigation Report on soil type and quality; Erodibility potential; Bank stability potential (for the reclaimed area)	Describe capability of the land to accommodate the proposed use/development If applicable, provide discussions on		✓							

Control No.: ☐ 1st ☐ 2nd ☐ 3rd ___ th Screening

t Name: Proposed 360 Hectares Reclamation Project

List of Key Impacts	Baseline Data Parameter Requirements	Required Assessment Methodology/Approach	✓ for completeness during procedural screening; page numbers should be provided upon submission of the EIS								Remarks
			Baseline Conditions		Impact Analysis		Mgmt. Plan		Monitoring Plan		
During scoping: Unless otherwise specified as agreed during scoping, all items listed are required. Write specific instructions (if any) on the blanks/spaces provided			Page	✓	Page	✓	Page	✓	Page	✓	
		possible soil contaminations due to project operation JSLE / similar modeling when applicable									
3.2 Change in soil quality/fertility (N/A)	Laboratory results on soil sample analysis for N, P, K, pH, organic matter, micronutrients and trace metals e. g. Pb, Hg, As, Cd, Cr hexavalent, etc.	Physical analysis (water holding capacity, texture aggregate stability of dam); Secondary data: chemical analysis									
4 Terrestrial Ecology (NA)											
4.1 Vegetation removal and loss of habitat	• Flora and fauna species inventory or survey report; • Historical occurrences of pest infestation, forest/grass fire and/or similar incidences	Quadrat sampling for flora; Use of mist nets, traps, transect walk for fauna									
4.2 Threat to existence and/or loss of important local species	Summary of endemicity / conservation status	include discussions on overall impact to flora and fauna									
4.3 Threat to abundance, frequency and distribution of important species	• Summary of abundance, frequency and distribution • Economic importance and uses of significant flora and fauna	include impact assessment on vegetation (eg. likelihood of destruction) and specific management measures (eg. protection, balling, transplanting, replacement etc.)									
4.4 Hindrance to wildlife access	Sampling / survey map in relation to the project site										
. THE WATER											
.1. Hydrology/Hydrogeology											
.1.1 Change in drainage morphology / ıducement of flooding/ Reduction in tream volumetric flow	Drainage map; historical flooding/drought occurrences, stream flow measurements/estimates; Delineation of watershed /sub-watersheds/ floodplain; and identification of aquifers if any	Discuss possible impacts of the project on the occurrence of flooding and vice versa. Consider extreme weather conditions and the PAG-ASA 2020 and 2050 climate projections Assessment should include potential occurrence or aggravation of flooding in nearby areas									
.1.2 Change in coastal water depth	Regional hydrogeological map										

List of Key Impacts	Baseline Data Parameter Requirements	Required Assessment Methodology/Approach	✓ for completeness during procedural screening; page numbers should be provided upon submission of the EIS								Remarks
			Existing Conditions		Impact Analysis		Mgmt. Plan		Monitoring Plan		
			Page	✓	Page	✓	Page	✓	Page	✓	
during scoping: Unless otherwise specified as agreed during scoping, all items listed are required. Write specific instructions (if any) on the blanks/spaces provided											
.3 Depletion of water resources / mpetition in water use (discussed in ople module)	Identification of current / projected water use (groundwater/surface water) in the area and adjacent areas Spring and well inventory and location map, depth of water table Analysis/estimation of water availability taking into consideration the PAG-ASA 2020 and 2050 climate projections	For project with significant water requirement, conduct water balance/ budget analysis (if applicable) and relate to the possibility of depleting water resources.									
Oceanography											
.1 Change/disruption in circulation tern	Predicted tides; 24-hour tidal cycles; Surface current system										
.2 Change in bathymetry	Bathymetric map;	USLE / similar modeling when applicable									
Water Quality											
.1 degradation of groundwater quality (A)	Physico-Chemical characterization of water : ☐ pH ☐ BOD ☐ COD ☐ DO ☐ Oil and grease ☐ TSS ☐ Heavy Metals Cr^{+6}, As, Hg, Cd, Pb ☐ fecal / total coliform ☐ nutrients: nitrates and phosphates ☐ others _____ sampling site map	Use DENR standard methods and procedures for sampling and analysis. For project with coastal/marine structures and /or significant marine / coastal discharges, conduct circulation / plume modeling (include worst case scenario of failure of WTF and other emergency/accident scenarios). If applicable, provide Aquifer (Groundwater) vulnerability Assessment (ie. discussions on groundwater contamination due to project operation) or groundwater contamination modeling If applicable, include discussions on possible contamination due to leaks/spills									
.2 degradation of surface water quality (A)											
.3 degradation of coastal/marine water ality											

List of Key Impacts	Baseline Data Parameter Requirements	Required Assessment Methodology/Approach	✓ for completeness during procedural screening; page numbers should be provided upon submission of the EIS								Remarks
			Baseline Conditions		Impact Analysis		Mgmt. Plan		Monitoring Plan		
during scoping. Unless otherwise specified or agreed during scoping, all items listed are required. Write specific instructions / if any) on the blanks/spaces provided			Pap	✓	Pap	✓	Pap	✓	Pap	✓	
Freshwater Ecology (N/A)											
.1 Threat to existence and/or loss species of important local and habitat	• Summary of endemicity / conservation status • Abundance of ecologically and economically important species (fishes, benthos, planktons); • Presence of pollution indicator species; sampling site map	Include discussions on overall impact to freshwater ecology									
.2 Threat to abundance, frequency and tribution of species											
Marine Ecology											
.1 Threat to existence and/or loss of portant local species and habitat	• Abundance/densities/distribution of ecologically and economically important species (mangroves, fishes, benthos, planktons, coral reefs, algae, seaweeds, sea grasses and marine birds); • Presence of pollution indicator species; • Historical occurrences of red-tide, fish kill or any related event • marine resource map sampling site map	Quadrat, transect, line intercept, spot dive, manta tow, marine resource characterization (e.g. municipal and commercial fisheries data) Include discussions on overall impact to marine ecology									
.2 Threat to abundance, frequency d distribution											
THE AIR											
Meteorology/Climatology											
.1 Change in the local climate e.g. local perature	Monthly average rainfall and temperature of the area; Climatological normals/extremes; Wind rose diagrams; Frequency of Tropical cyclones	In the assessment, consider the PAG-ASA climate change projections for 2020 and 2050.									
.2 Contribution in terms of greenhouse emissions	Data on Greenhouse gasses (i.e. carbon dioxide, nitrous oxide); Calculation of projected GHG emission	Discuss the project's contribution in terms of greenhouse gas emissions									
Air Quality (& Noise)											
.1 Degradation of air quality	characterization of ambient air quality: ☐ TSP ☐ PM10 ☐ SOx ☐ NOx ☐ others: _____ (for sampling methods refer to Clean Air Act) sampling site map	Use DENR standard methods and procedures for sampling and analysis									

Control No.
☐ 1st ☐ 2nd ☐ 3rd ___ th Screening

List of Key Impacts	Baseline Data Parameter Requirements	Required Assessment Methodology/Approach	✓ for completeness during procedural screening; page numbers should be provided upon submission of the EIS								Remarks
			Baseline Condition		Impact Analysis		Mgmt Plan		Monitoring Plan		
During scoping: Unless otherwise specified as agreed during scoping, all items listed are required. Write specific instructions / if any) on the blanks/ spaces provided			Page	✓	Page	✓	Page	✓	Page	✓	
3.2.2 Increase in ambient noise level	Characterization of ambient noise level sampling site map	Use DENR standard methods and procedures for sampling and measurement. If applicable noise attenuation modeling (applicable if there is source capable of generating 200 dB or more).									
4.0 THE PEOPLE											
4.1 Displacement of users needing access to water bodies Displacement / disturbance of properties Change/conflict in land ownership Change/conflict Right of way	Demographic data of impact area: - Number of households and household size - Land area, - Population, - Population density /growth - gender and age profile, - literacy rate, profile of educational attainment settlements map	Discuss how the project would affect existing properties in the area in terms of relocation and devaluation									
4.2 In-migration proliferation of informal settlers	Census of population / property that will be displaced / disturbed Housing ownership profile / availability of housing/ number of informal settlers	Discuss the in-migration patterns as a result of project implementation									
4.3 Cultural/Lifestyle change (especially involving employees in the nearby developed areas of the site and vicinity)	Demographic data (especially involving employees in the nearby developed areas of the site and vicinity) Historical value and cultural value have to be assessed as per the perspective of NCCA and NHI (specific focus also on the Magsaysay's Presidential proclamation in the Manila Bay)	Discuss the impacts on change (especially involving employees in the nearby developed areas of the site and vicinity)									
4.4 Threat to delivery of basic services /resource competition	Availability of public services in terms of: • Water supply • Power supply	Discuss how the project would affect the delivery of basic services and may result to resource competition in the area									

GENERIC ECC APPLICATION SCREENING FORM

List of Key Impacts	Baseline Data Parameter Requirements	Required Assessment Methodology/Approach	✓ for completeness during procedural screening; page numbers should be provided upon submission of the EIS								Remarks
			Baseline Conditions		Impact Analysis		Mgmt Plan		Monitoring Plan		
During scoping: Unless otherwise specified as agreed during scoping, all items listed are required. Write specific instructions (if any) on the blanks/spaces provided			Page	✓	Page	✓	Page	✓	Page	✓	
5 Threat to public health and safety	• Communications /transportation • health resources (Government and Private) • peace and order / crime • education facilities • recreational facilities / sports facilities statistical data / information related to public services: • literacy rate, profile of educational attainment • Morbidity and mortality rates (infants and adults - 5-year trend) • Common diseases in the area including endemic diseases; • Environmental Health and Sanitation Profile; • Crime rate • Food security	Discuss the project implementation's threat to public health vis-à-vis the baseline health conditions in the area Analysis of diseases that may be affected by climate change. Site and vicinity (adjacent barangays)									
6 Generation of Local Benefits from the project Enhancement of employment and livelihood opportunities Increased business opportunities and associated economic activities Increased revenue of LGUs	Socioeconomic data: • Main sources of income • Employment rate/ profile • Poverty incidence • sources of livelihood • commercial establishments and activities • banking and financial institutions										
7 Traffic congestion (water and land)	Road network/ systems – (consider navigation results, fishing/baklad location) Existing Transportation/traffic situation	Traffic impact assessment if applicable (including capacity of road system in terms of load/count)									
8 Impact on the commercial establishment along Roxas Blvd. within the Barangay directly adjacent to the project	FGD, KII or Perception Survey of stakeholders within the site and vicinity (with emphasis on the vicinity); Proponents must justify their choice of methodology for assessing stakeholders' perception										
9 Impact on Tourism	Consultation with DOT, PTA and tourism community within the vicinity of the site										

III. Environmental Risk Assessment

Type of Risks	Scope of Assessment	Report/Output Required	Present? (✓) ERA		ERP		Monitoring Plan		REMARKS
			Page	✓	Page	✓	Page	✓	
Safety Risks ✓ Fire ✓ Explosion ✓ Release of toxic substances ✓ Oil spill risk	- Identify conditions, events and circumstances which could be significant in bringing about identified safety risks - Description & assessment of the possible accident scenarios - Assessment of whether the project location is projected to have extreme climate events for 2020 &or 2050 that could contribute to the triggering identified scenarios - Description of the hazards, both immediate (acute effects) and delayed (chronic effects) for man and the environment posed by the release of toxic substance, as applicable	EIA REQUIREMENT ☐Quantitative Risk Assessment(QRA) Specific Instructions: ☐Descriptive/Qualitative Risk Assessment Specific Instructions: ☐ EMERGENCY PLAN Specific Instructions: ***Refer to annex 2-7e for the decision criteria the outline***							
✓ Physical Risks (Failure of Structure wic could endanger life, property and/or the environment, sea vessel collision, occupational hazard etc.)	- Identify conditions, events and "trigger" which could be significant in bringing about identified physical risks - Description & assessment of the possible accident scenarios - Assessment of whether the project location is projected to have extreme climate events for 2020 &or 2050 that could contribute to the triggering identified scenarios - Description of the hazards both immediate (acute effects) and delayed (chronic effects) for man and the environment posed by the failure of structure, as applicable								

Note: 1. Public hearing is required as recommended by the EIARC. The venue should be in the neutral ground not managed by the LGU.
2. Additional members of the Review Committee and Resource Persons may be added on other areas of expertise/modules when necessary during the course of EIA review.

Noted By:	Signature		Signature
Review Committee Members		EMB Representatives	
1. Ms. Jo Rowena Garcia	Jo Rowena O. Garcia	1. Engr. Joel Polintan	
2. Mr. Agerico de Vila		2. Mr. Carl Louie Santiago	
3. Mr. Oskar Cruz			
		Project Proponent:	
Resource Persons		1. Engr. Alvin D. Lipa-Reducin	
1. Manila Bay Office		Project Preparer/Consultant:	
2. Philippine Reclamation Authority		1.	
3. EMB NCR Office			

0436

Republic of the Philippines
Pasay City, Metro Manila
Office of the Mayor

8 July 2013

Hon. **RAMON J. P. PAJE**
Secretary
Department of Environment and Natural Resources
Quezon City

929-66-76
July 2013 Farida
DEPT. OF ENVIRONMENT & NATURAL RES.
RECEIVED
JUL 11 2013
RECORDS MGT. & DOCUMENTATION

ATTENTION :
Ms. NERIA A. ANDIN
CESO III
Regional Executive Director
Department of Environment and Natural Resources
National Capital Region

Subject : **Area Clearance for the Proposed Pasay City 60-Hectare Reclamation Project Along the Coast of Manila Bay**

Dear Sir :

It is our pleasure to inform you that the City of Pasay will be undertaking a milestone project involving the reclamation of 60 hectare of the Manila Bay. This Project which will be implemented using environmentally-sound technologies and methodologies will greatly benefit the peoples of Pasay and adjoining cities especially in terms of poverty alleviation.

As one of the requirements in our application for an Environmental Compliance Certificate (ECC) which is now under process by the EIA/EMB we are pleased to submit herewith the corresponding application for an Area Clearance/Reclamation Permit.

We wish to take note that DAO 2007-20 dated 31 July 2007 stipulates among others the procedural requirements for the securing of a "Reclamation Permit" and the DENR organization mandated to process the application (Appendix 1 of the DAO).

We trust that these documents meet your requirements. Should you/your concerned personnel needs further clarifications you may contact our EIA Consultant

Dr. Edgardo G. Alabastro
Mobile No. 0917 825 5203
Office Address : Unit 603 FMSG Bldg., Balete Drive, Quezon City
Telefax : (02) 416 4625

We thank you for your kind consideration.

Sincerely yours,

ANTONINO G. CALIXTO
City Mayor

Republika ng Pilipinas
LUNGSOD NG PASAY, KALAKHANG MAYNILA

28 August 2014

RECEIVED
SEP 10 2014

The Honorable
Ramon R.J.P Paje
Secretary
Department of Environment and Natural Resources
Visayas Avenue, Quezon City

Attention : Lourdes C. Wagan
Regional Executive Director
DENR-NCR

On 08 July 2013 The Honorable Mayor Antonino G. Calixto of the City of Pasay wrote the Honorable Secretary Ramon R.J.P. Paje (copy of letter herewith attached) informing him of the proposed 60-hectare reclamation Project of the City and submitting thereto the application papers for an Area Clearance.

As of now, the City is contemplating of expanding the reclamation area from 60 hectares to a new total area of 360 hectares.

In this connection kindly inform us of the procedural and documentary requirements for making said application for an Area Clearance. To date we have not been favored with a reply to the 08 July 2013 letter.

Should you/your concerned personnel needs further information on the project you may contact the undersigned or our duly authorized EIA Consultant:

Dr. Edgardo G. Alabastro
Technotrix Consultancy Services, Inc.
305 PMSS Building, Balete Drive, Quezon City
Telephone (02) 416 4625
Mobile (0917) 825 5203

Thank you.

Sincerely yours,

Atty Severo C. Madronia
City of Pasay Legal Officer

DENR-NCR
ADMINISTRATIVE RECORDS SECTION
REF. DOC.
RECEIVED
BY:
DATE: 9/8/14
TIME:
BY:
DATE:
TIME:

Republika ng Pilipinas
Lungsod ng Pasay, Kalakhang Maynila
TANGGAPAN NG ALKALDE

June 15, 2015

Ms. Lourdes C. Wagan
OIC-Regional Director
DENR, NCR
Cuarteles St., Ermita, Manila

Dear **Director Wagan,**

This is to formally request for the issuance by your Office of a preliminary locational area clearance involving the proposed 60-hectare and 300-hectare Reclamation Projects of the City Government of Pasay along the coast of Manila Bay, Pasay City.

This request is filed with your Office pursuant to the guidance of the DENR, Central Office through DENR Undersecretary and concurrent EMB Director **Atty. Jonas R. Leones** per his letter dated May 22, 2015, advising the undersigned to file the request for site or area clearance with the DENR NCR prior to the issuance of the required ECC. Copy of the cited letter is hereto attached as Annex "A".

As defined under existing rules, an area or site clearance refers to *"the document issued by the concerned Department of Environment and Natural Resources (DENR) sector that the area(s) covered thereby are free and open for the grant of a Reclamation Application."* ***(Sec. 3.1, 4.1 (b), NEDA-PRA Joint Order No. 01-2015).***

In determining whether the areas covered are free and open for a reclamation application, your Office may rely on existing status of the area or, if you deem it necessary, take into account **Sec. 7 of DENR AO No. 2007-20** which speaks of a composite team created by the RED to undertake the following tasks –

a. To evaluate, review and validate proposed and existing reclamation projects in their respective jurisdiction.

b. To conduct field investigation and inspection to ascertain the suitability of the area proposed for reclamation and the appropriate land use of the reclaimed land; and

c. To prepare and submit a report to the RED recommending approval or disapproval of proposed reclamation projects and proclamation of reclaimed areas.

To expedite the processing of the request, the undersigned is authorizing our City Legal Officer, **Atty. Severo C. Madrona Jr.**, to personally coordinate with you and your personnel.

Thank you.

Very truly yours,

ANTONINO G. CALIXTO
City Mayor

Copy furnished:

Atty. Jonas R. Leones
DENR Undersecretary
and concurrent EMB Director

Technotrix Consultancy Services



ENVIRONMENTAL MANAGEMENT BUREAU
DENR Compound, Visayas Avenue, Diliman, Quezon City 1116
Telephone Nos. 927-15-17; 928-20-96
Email: emb@emb.gov.ph
Visit us at http://www.emb.gov.ph

MAY 22 2015

OFFICE OF THE CITY MAYOR
Pasay City Hall, F.B. Harrison St.
Pasay City

Attention: **Honorable Antonio G. Calixto**
City Mayor

Subject : **ECC APPLICATION OF LOCAL GOVERNMENT UNIT OF PASAY CITY FOR THE PROPOSED 360- HECTARE RECLAMATION PROJECT ALONG THE COAST OF MANILA BAY, CITY OF PASAY**

Dear **Mayor Calixto**:

This refers to your letter dated 21 April 2015 regarding the ECC application for the proposed 60-hectare and 300-hectare Reclamation Projects along the coast of Manila Bay, City of Pasay.

Please be reminded that under Section 2 and 3 of the Executive Order No. 672[1] dated 19 October 2007 which state that:

> *[2]Prior to approval of any reclamation project, the PRA (PEA) is hereby directed to coordinate and secure from DENR a permit authorizing/clearing a particular area to be the site of the proposed reclamation project, otherwise known as the* ***area permit*** *or* ***site clearance****.*
>
> *[3]Prior to the implementation of the duly approved reclamation projects, the Environmental Compliance Certificate (ECC) shall be secured from DENR and that no reclamation works shall commence without the required ECC.*

Considering the above, this Office shall officially accept your application and proceed with the review and evaluation process upon the submission of **area permit** or **site clearance** from the DENR NCR with Office address at Cuarteles St, Ermita, Manila, Metro Manila.

For your information and guidance.

Sincerely,

ATTY. JONAS R. LEONES
DENR Undersecretary
and concurrent EMB Director

CC : Technotrix Consultancy Services

[1] Attached copy of Executive Order No. 672

PUBLIC HEARING REPORT FOR THE

PROPOSED 360 HECTARES RECLAMATION PROJECT
LOCATED ALONG COAST OF MANILA BAY, PASAY CITY

23 AUGUST 2016
Cuneta Astrodome, Pasay City

1. Announcements / Notice of Postings / Invitations

Announcements were properly made at least 21 days before the date of the Public Hearing.

- 1st Newspaper Publication - 01 August 2016
- 2nd Newspaper Publication - 08 August 2016

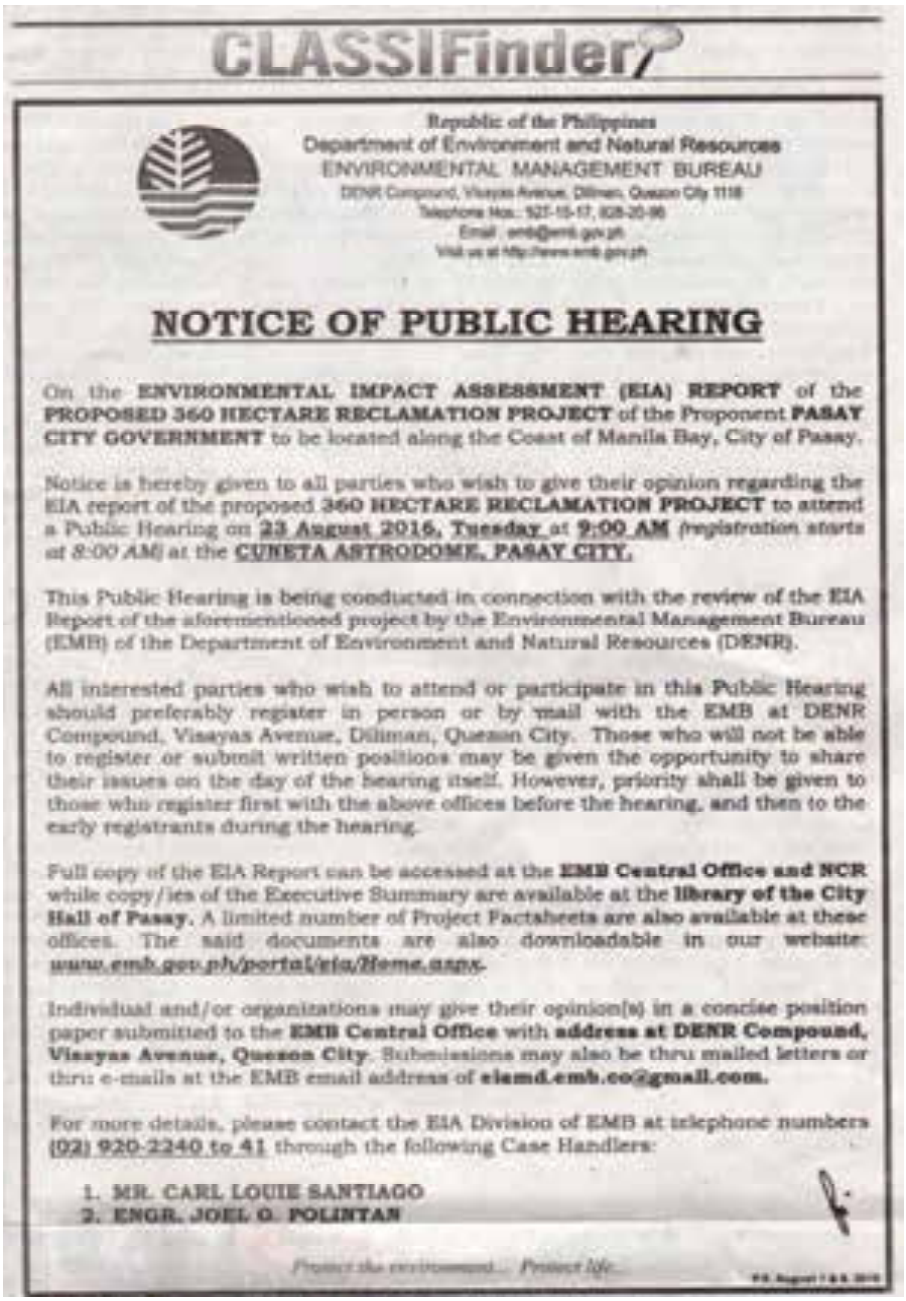
Copies of the newspaper announcements are shown on **pages 2 and 3.**

Invitations to the stakeholders were delivered personally except for a few whose locations were not easy to find. In addition, the letter invitations were also sent via LBC.

Typical copy of the invitations is shown on **page 14.**

AUGUST 2016

- **1st Newspaper Publication - 01 August 2016**



CLASSIFinder

Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
DENR Compound, Visayas Avenue, Diliman, Quezon City 1118
Telephone Nos.: 927-15-17, 928-20-96
Email : emb@emb.gov.ph
Visit us at http://www.emb.gov.ph

NOTICE OF PUBLIC HEARING

On the **ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT** of the **PROPOSED 360 HECTARE RECLAMATION PROJECT** of the Proponent **PASAY CITY GOVERNMENT** to be located along the Coast of Manila Bay, City of Pasay.

Notice is hereby given to all parties who wish to give their opinion regarding the EIA report of the proposed **360 HECTARE RECLAMATION PROJECT** to attend a Public Hearing on **23 August 2016, Tuesday** at **9:00 AM** *(registration starts at 8:00 AM)* at the **CUNETA ASTRODOME, PASAY CITY.**

This Public Hearing is being conducted in connection with the review of the EIA Report of the aforementioned project by the Environmental Management Bureau (EMB) of the Department of Environment and Natural Resources (DENR).

All interested parties who wish to attend or participate in this Public Hearing should preferably register in person or by mail with the EMB at DENR Compound, Visayas Avenue, Diliman, Quezon City. Those who will not be able to register or submit written positions may be given the opportunity to share their issues on the day of the hearing itself. However, priority shall be given to those who register first with the above offices before the hearing, and then to the early registrants during the hearing.

Full copy of the EIA Report can be accessed at the **EMB Central Office and NCR** while copy/ies of the Executive Summary are available at the **library of the City Hall of Pasay.** A limited number of Project Factsheets are also available at these offices. The said documents are also downloadable in our website: **www.emb.gov.ph/portal/eia/Home.aspx.**

Individual and/or organizations may give their opinion(s) in a concise position paper submitted to the **EMB Central Office** with **address at DENR Compound, Visayas Avenue, Quezon City**. Submissions may also be thru mailed letters or thru e-mails at the EMB email address of **elamd.emb.co@gmail.com.**

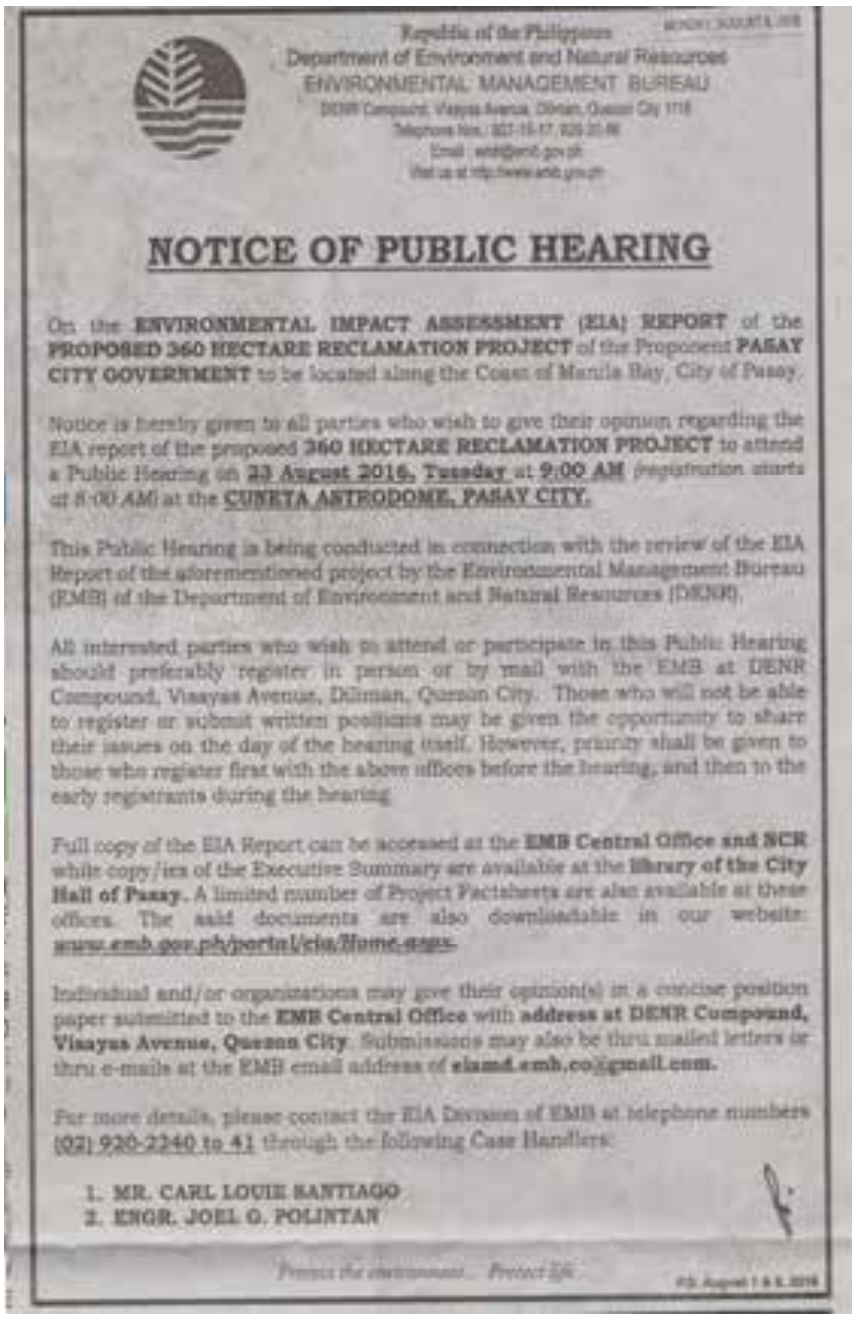
For more details, please contact the EIA Division of EMB at telephone numbers (02) 920-2240 to 41 through the following Case Handlers:

1. **MR. CARL LOUIE SANTIAGO**
2. **ENGR. JOEL O. POLINTAN**

Protect the environment... Protect life...

AUGUST 2016

- **2nd Newspaper Publication - 08 August 2016**



Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
DENR Compound, Visayas Avenue, Diliman, Quezon City 1116
Telephone Nos.: 927-15-17, 929-21-98
Email: emb@emb.gov.ph
Visit us at http://www.emb.gov.ph

NOTICE OF PUBLIC HEARING

On the **ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT** of the **PROPOSED 360 HECTARE RECLAMATION PROJECT** of the Proponent **PASAY CITY GOVERNMENT** to be located along the Coast of Manila Bay, City of Pasay.

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This Public Hearing is being conducted in connection with the review of the EIA Report of the aforementioned project by the Environmental Management Bureau (EMB) of the Department of Environment and Natural Resources (DENR).

All interested parties who wish to attend or participate in this Public Hearing should preferably register in person or by mail with the EMB at DENR Compound, Visayas Avenue, Diliman, Quezon City. Those who will not be able to register or submit written positions may be given the opportunity to share their issues on the day of the hearing itself. However, priority shall be given to those who register first with the above offices before the hearing, and then to the early registrants during the hearing.

Full copy of the EIA Report can be accessed at the **EMB Central Office and NCR** while copy/ies of the Executive Summary are available at the **library of the City Hall of Pasay.** A limited number of Project Factsheets are also available at these offices. The said documents are also downloadable in our website: **www.emb.gov.ph/portal/eia/Home.aspx**

Individual and/or organizations may give their opinion(s) in a concise position paper submitted to the **EMB Central Office** with **address at DENR Compound, Visayas Avenue, Quezon City**. Submissions may also be thru mailed letters or thru e-mails at the EMB email address of **elamd.emb.co@gmail.com.**

For more details, please contact the EIA Division of EMB at telephone numbers (02) 920-2240 to 41 through the following Case Handlers:

1. **MR. CARL LOUIE SANTIAGO**
2. **ENGR. JOEL G. POLINTAN**

Protect the environment... Protect life.

P.D. August 1 & 8, 2016

2.0 Invited Stakeholders

The list of invitees shown below included stakeholders outside the Direct and Indirect Impact Areas. The participants to the Public Scoping forum were invited.

The list is as follows:

1. **HON. VICE PRESIDENT**
   Office of the Vice President
   Coconut Palace CCP Complex
   Pasay City

2. **HON. BOYET DEL ROSARIO**
   PASAY CITY VICE MAYOR
   Pasay City Hall Building
   F.B. Harrison, Pasay City

3. CITY PLANNING AND DEVELOPMENT COORDINATOR
   Pasay City Hall Building
   F.B. Harrison, Pasay City

4. CITY ENGINEER
   Pasay City Hall Building
   F.B. Harrison, Pasay City

5. CITY HEALTH OFFICER
   Pasay City Hall Building
   F.B. Harrison, Pasay City

6. **CITY COUNCILS OFFICE**
   Pasay City Hall Building
   F.B. Harrison, Pasay City

7. **ROSE SAN MIGUEL**
   Chairwoman
   Brgy. 76 Zone 10
   Pasay City

8. **Ma Lourdes Ferrer**
   Deputy Executive
   Manila Bay Coordinating Office
   Nursery Compound, North Avenue, Diliman, Quezon City

9. **Lourdes C. Wagan**
   OIC, Regional Director

   DENR-National Capital Region

   Nursery Compound, North Avenue, Diliman, Quezon City

10. **VIZMINDA A OSORIO**
    Regional Director
    DENR-EMB NCR

11. **ABAYA, PETER ANTHONY A.**
    General Manager and Chief Executive
    Philippine Reclamation Authority (PRA)
    7th Floor, Legaspi Towers 200 Bldg, 107
    Paseo de Roxas Street, Legaspi Village

12. **PASAY CITY TRAFFIC AND MANAGEMENT BUREAU**
    F.B. Harrison, Pasay City

13. **ATTY. MICHAEL DRAKE MATIAS**
    Chief, EIAMD
    DENR -EMB Central Office

14. **SCHOOL DIVISION SUPERINTENDENT**
    Divisions of City Schools, Pasay
    Zamora St., Pasay City

15. **CHAIRMAN**
    Manila Yatch Club
    2351 Roxas Boulevard, Manila

16. **THE PRESIDENT**
    Sofitel Manila
    Philippine Plaza Holdings, Inc.
    Room 155 Sofitel Phil. Plaza CCP Complex
    Roxas, Boulevard, Pasay City
    551-5625
    551-5619

17. THE PRESIDENT
Government Services Insurance System
Financial Center, Pasay City

18. ATTY. JUAN C. STA. ANA
General Manager
PHILIPPINE PORTS AUTHORITY
Bonifacio Drive, South Harbor

19. VICE ADMIRAL CAESAR C. TACCAD
Philippine Navy
Naval Station Jose V Andrada
#2335 Roxas Boulevard, Manila
PLDT Line: +632-524-20-61 to 69

20. MR. RAUL M. SUNICO, Ph.D
President
Cultural Center of the Philippines
CCP Complex, Roxas Boulevard, Pasay City, Metro Manila, Philippines
Phone: Trunkline (632) 832-1125; Directline (632) 834-0468

21. MR. ADRIAN ROSS
Executive Director
Partnership in Environmental Management for the Seas of East Asia (PEMSEA)
DENR Compound, Diliman Quezon City

22. SECRETARY RAMON JIMENEZ JR.
Department of Tourism
DOT Building, Agrifina Circle, Rizal Park
Manila

23. LIGA NG MGA BARANGAY
4th Floor Pasay City Hall Building
F.B. Harrison, Pasay City

24. Non-Government Organization (NGO's)
Accredited with the City of Pasay

LIST OF NGO's/PO's

No.	NAME OF ORGANIZATION	ADDRESS	PRESIDENT	CONTACT NO.
1	Emma Homeowners Association Inc.	No.61 Emma St. Pasay City	Mrs. Adelaida Paciente	889-9231
2	Prime Movers Multi Purpose Cooperative	Rm. 426 4th F Pasay City Hall Pasay City	Engr. Rolando Londonio	0920-9065756
3	Pasay City Network for the Protection of Children	2442 Torres Bldg. Park Ave. Pasay City	Mr. Samuel Enesando	
4	Our Lady of Sorrows Outreach Foundation	2130 F.B. Harrison St. Pasay City	Rev. Fr. Socrates Montealto	
5	Peace and Order Force Multiplier	181 P. Santos St. Malibay Pasay City	Mr. Alfredo Francisco	853-8013
6	Eduardo "DUAY" Calixto Foundation Inc.	167 San Juan St. Malibay Pasay City	Mr. Edgardo M. Rubiano	
7	Maricaban Market Vendors Association Inc.	Block 23 St.Peter St. Maricaban Pasay City	Ms. Cristina Avila	0918-5243940
9	Sun Valley NAIA Stall Owner & Vendors Association Inc.	No.16 Sun Valley Drive NAIA, Pasay City	Ms. Fe Amador	

No.	NAME OF ORGANIZATION	ADDRESS	PRESIDENT	CONTACT NO.
10	E.Cornejo Vitalez Residents Association Inc.	No.741 Vitales St. Malibay Pasay City	Ms. Teresita Ligtas	
11	Geronimo Homeowners Association Inc.	282 M. Geronimo St. Malibay Pasay City	Ms. Armida Cerdeña	0915-8886730 854-2919
12	Family Touch Malibay Association Inc.	842 A I. Santos St. Malibay Pasay City	Ms. Vilma B. Penos	912-3629
13	SPECS Foundation Inc.	53 Cementina St. Pasay City	Sandra M. Camesa	5860336/ 5527030
14	SERRAS Center for Girls	162 Sinsiego St.F.B.Harrison St. Pasay City	Sr.Nida Viovicente(Exec.Director)	524-4705 Fax 524-4083
15	Pangarap Foundation	2503 Taft Ave. cor. Escobal St. Pasay City	Ms.Leah Lamsuela(Program Director) Ma.Victoria C. Yulo(President)	834-1061-telefax

Others:

1. **MS. GEMMA G. CRUZ-ARANETA**
   Chairperson
   Heritage Conservation Society (HCS)
   G/F Museo Pambata Building, Roxas Boulevard, Ermita Manila, Philippines
   Tel. No. +632 353 4494
   Fax No. +632 522 2497

2. **SAVE OUR SUNSET (SOS) MANILA BAY PHILIPPINES**
   https://www.facebook.com/savemanilabay

3. **MR. HENRY T. SY, JR.**
   One E-com Center, 10th Floor Harbor Drive
   Mall of Asia Complex, CBP-IA
   Pasay City 1300, Philippines

4. **REV. FR. BENITO TUAZON**
   Ministry on Ecology and Commission on Social Services and Development
   The Roman Catholic Archdiocese of Manila
   Caritas Manila Compound
   2002 Jesus St., Pandacan, Manila

5. **DR. RENATO SOLIDUM**
   Philippine Institute of Volcanology and Seismology (PHIVOLCS)
   PHIVOLCS Building, C.P. Garcia Avenue, U.P. Campus, Diliman, Quezon City, Philippines

6. **MR. NEREUS ACOSTA**
   General Manager
   Laguna Lake Development Authority (LLDA)
   4/F Annex Bldg., Sugar Regulatory Administration (SRA) Compound
   North Ave., Diliman, Quezon City
   Phone 332-2346

7. **ENGR. EMITERIO HERNANDEZ**
   Hydrologist
   Laguna Lake Development Authority (LLDA)
   4/F Annex Bldg., Sugar Regulatory Administration (SRA) Compound
   North Ave., Diliman, Quezon City
   Phone 376-4044

8. **MR. LORY TAN**
   President, World Wildlife Fund
   WWF-Philippines Headquarters
   4th Floor JBD Plaza #65 Mindanao Avenue
   Barangay Bagong Pag-asa, Quezon City

   1105 Philippines
   Tel: +632 920 79 23/26/31
   Fax: +632 426 39 27
   Email: kkp@wwf.org.ph

9. THE UNITED ARCHITECTS OF THE PHILIPPINES
UAP Building, 53 Scout Rallos Street, Barangay Laging Handa
Diliman 1103 Quezon City, Philippines
Phone (+632) 4126403; 4126364; 4123311; 4120051; 4126394
Fax (632) 3721796
E-mail: uapnational@yahoo.com; uapnational@gmail.com

10. DIRECTOR MUNDITA LIM
Protected Area and Wildlife Bureau
Department of Environment and Natural Resources
Ninoy Aquino Parks and Wildlife Center
Diliman, 1100 Quezon City
Philippines
+(63 2) 9246031-35
+(63 2) 9240109
www.pawb.gov.ph
planning@pawb.gov.ph

11. ATTY. EMERSON S. CARLOS
Officer In-Charge
Metro Manila Development Authority (MMDA)
MMDA Bldg., EDSA cor. Orense St., Guadalupe, Makati City
Trunkline (632) 882-4154 to 74
Directline (632) 882-0854; 882-0893

12. ARCHITECT JUN PALAFOX
Palafox & Associates
11th Floor 6782 Ayala Avenue, Makati
(02) 812 1254

13. **Hon. Arsenio M. Balisacan**
Socioeconomic Planning Secretary
National Economic and Development Authority
6/F, NEDA Building , Ortigas Center,
Pasig City

14. ROGELIO L. SINGSON
Secretary
Department of Public Works and Highways (DPWH)
Bonifacio Drive, Port Area, Manila

15. BUREAU OF FISHERIES AND ACQUATIC RESOURCES (BFAR)
PCA Compound, Q. C. Elliptical Road, Diliman, Quezon City, 1101 Metro Manila

16. MS. JANETTE P. LORETO-GARIN
DOH
San Lazaro Compound, Tayuman, Sta. Cruz, Manila

----------CITY OF MANILA----------

01. HONOURABLE MAYOR JOSEPH EJERCITO ESTRADA
City Mayor
Manila City Hall, Arroceros, Manila

02. HONOURABLE VICE MAYOR HONEY LACUNA
City Vice Mayor, Manila
Manila City Hall, Arroceros, Manila

03. MANILA CITY COUNCIL
4th Floor Manila City Hall, Arroceros, Manila

04. CITY ENGINEER
Dept. of Engineering & Public Works
3rd Floor Manila City Hall, Arroceros, Manila

05. CITY PLANNING & DEVELOPMENT OFFICE
3rd Floor Manila City Hall, Arroceros, Manila

06. CITY TRAFFIC & PARKING BUREAU
3rd Floor Manila City Hall, Arroceros, Manila

----------LAS PIÑAS CITY ----------

01. **HONORABLE MAYOR IMELDA AGUILAR**
Alabang Zapote Road, Pamplona Tres
Las Piñas City

02. **HONORABLE VICE MAYOR LOUIE BUSTAMANTE**
Alabang Zapote Road, Pamplona Tres
Las Piñas City

03. **LAS PIÑAS CITY COUNCIL**
Alabang Zapote Road, Pamplona Tres
Las Piñas City

04. **CITY ENGINEER**
Alabang Zapote Road, Pamplona Tres
Las Piñas City

05. **CITY PLANNING & DEVELOPMENT OFFICE**
Alabang Zapote Road, Pamplona Tres
Las Piñas City

06. **CITY TRAFFIC MANAGEMENT OFFICE**
J. Aguilar Ave., Pamplona Tres
Las Piñas City

----------PARAÑAQUE CITY----------

01. HONORABLE MAYOR EDWIN OLIVAREZ
San Antonio Valley 1, Parañaque City

02. HONORABLE VICE MAYOR RICO GOLEZ
San Antonio Valley 1
Parañaque City

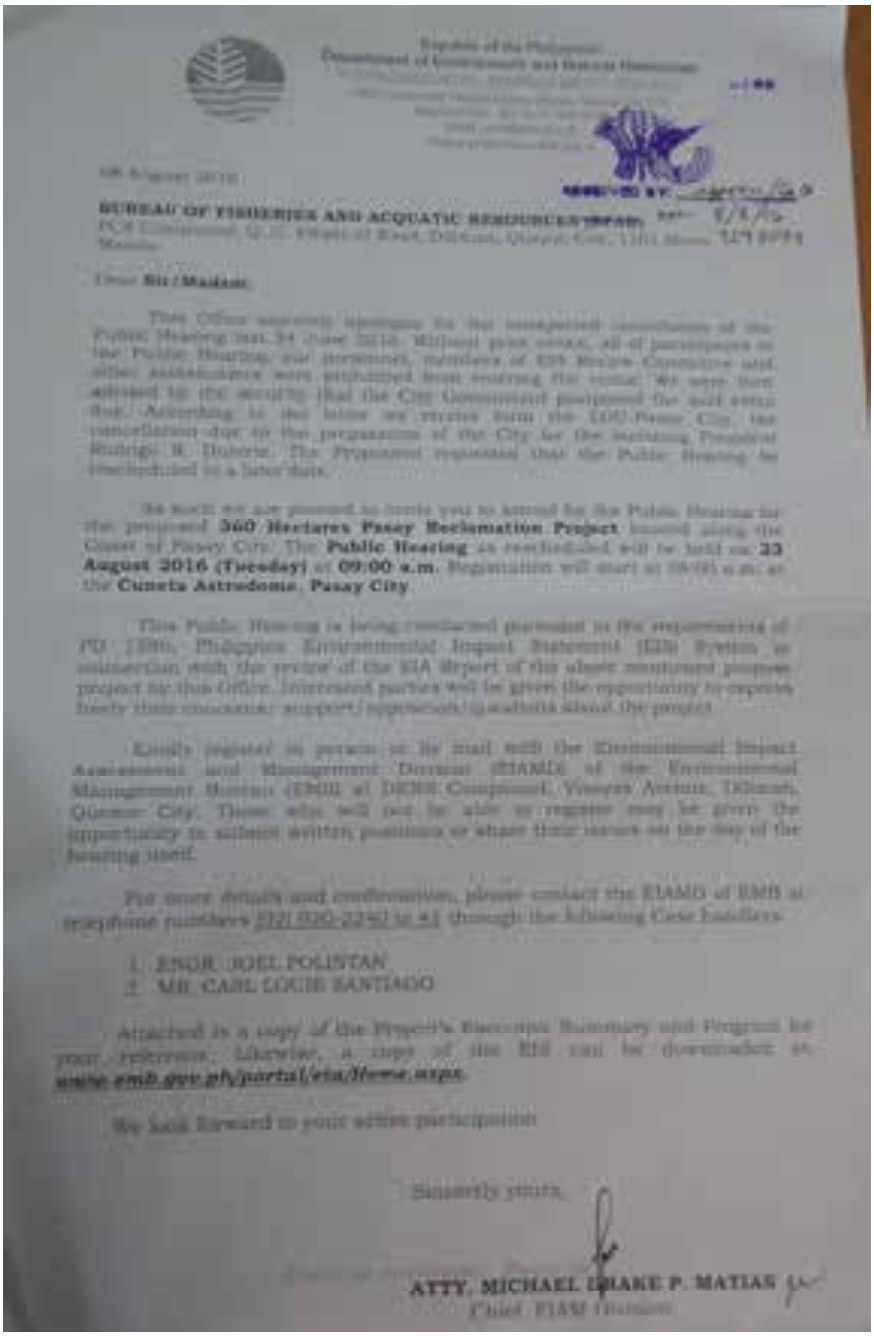
03. PARAÑAQUE CITY COUNCIL
San Antonio Valley 1
Parañaque City

04. CITY PLANNING & DEVELOPMENT OFFICE
San Antonio Valley 1
Parañaque City

05. CITY ENGINEER
San Antonio Valley 1
Parañaque City

06. CITY TRAFFIC MANAGEMENT OFFICE
San Antonio Valley 1
Parañaque City

3.0 Typical Received Copies of Invitations



Republic of the Philippines
Department of Environment and Natural Resources

08 August 2016

BUREAU OF FISHERIES AND AQUATIC RESOURCES (BFAR)
PCA Compound, Q.C. Elliptical Road, Diliman, Quezon City, 1101 Metro Manila

Dear **Sir / Madam**:

This Office sincerely apologizes for the unexpected cancellation of the Public Hearing last 24 June 2016. Without prior notice, all of participants to the Public Hearing, our personnel, members of EIA Review Committee and other stakeholders were prohibited from entering the venue. We were then advised by the security that the City Government postponed the said event due. According to the letter we receive from the LGU-Pasay City, the cancellation due to the preparation of the City for the inclusion President Rodrigo R. Duterte. The Proponent requested that the Public Hearing be rescheduled to a later date.

In view of we are pleased to invite you to attend for the Public Hearing for the proposed **360 Hectares Pasay Reclamation Project** located along the Coast of Pasay City. The **Public Hearing** as rescheduled will be held on **23 August 2016 (Tuesday)** at **09:00 a.m.** Registration will start at 08:00 a.m. at the **Cuneta Astrodome, Pasay City**.

This Public Hearing is being conducted pursuant to the requirements of PD 1586, Philippine Environmental Impact Statement (EIS) System in connection with the review of the EIA Report of the above mentioned proposed project by this Office. Interested parties will be given the opportunity to express freely their concerns/ support/opposition/ questions about the project.

Kindly register in person or by mail with the Environmental Impact Assessment and Management Division (EIAMD) of the Environmental Management Bureau (EMB) at DENR Compound, Visayas Avenue, Diliman, Quezon City. Those who will not be able to register may be given the opportunity to submit written positions or share their views on the day of the hearing itself.

For more details and confirmation, please contact the EIAMD of EMB at telephone numbers 929-926-2240 to 41 through the following Case Handlers:

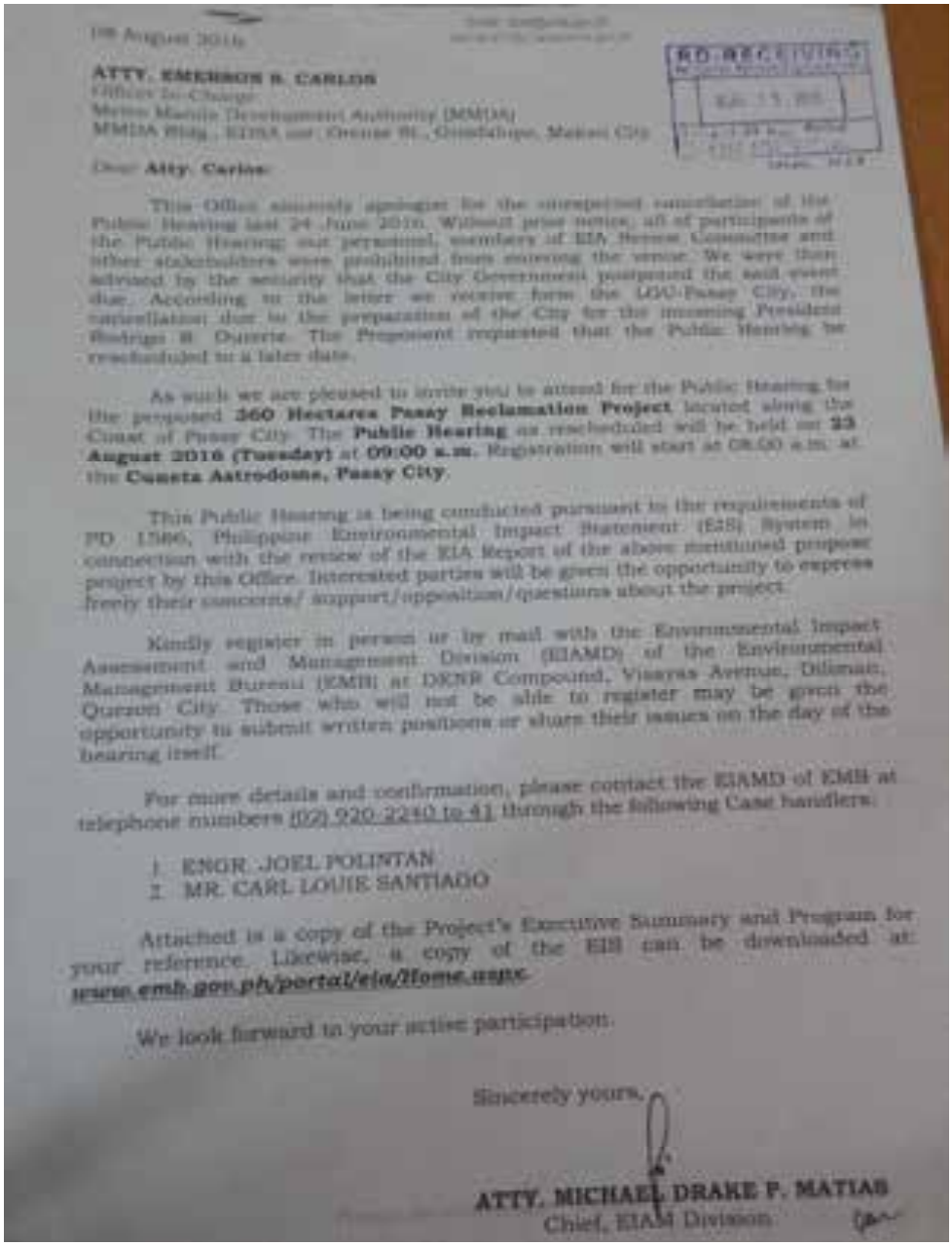
1. ENGR. JOEL POLISTAN
2. MR. CARL LOUIE SANTIAGO

Attached is a copy of the Project's Executive Summary and Program for your reference. Likewise, a copy of the EIS can be downloaded at: ***www.emb.gov.ph/portal/eia/Home.aspx***.

We look forward to your active participation.

Sincerely yours,

ATTY. MICHAEL DRAKE P. MATIAS
Chief, EIAM Division



08 August 2016

ATTY. EMERSON B. CARLOS
Officer In-Charge
Metro Manila Development Authority (MMDA)
MMDA Bldg., EDSA cor. Orense St., Guadalupe, Makati City

RECEIVED

Dear **Atty. Carlos:**

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1. ENGR. JOEL POLINTAN
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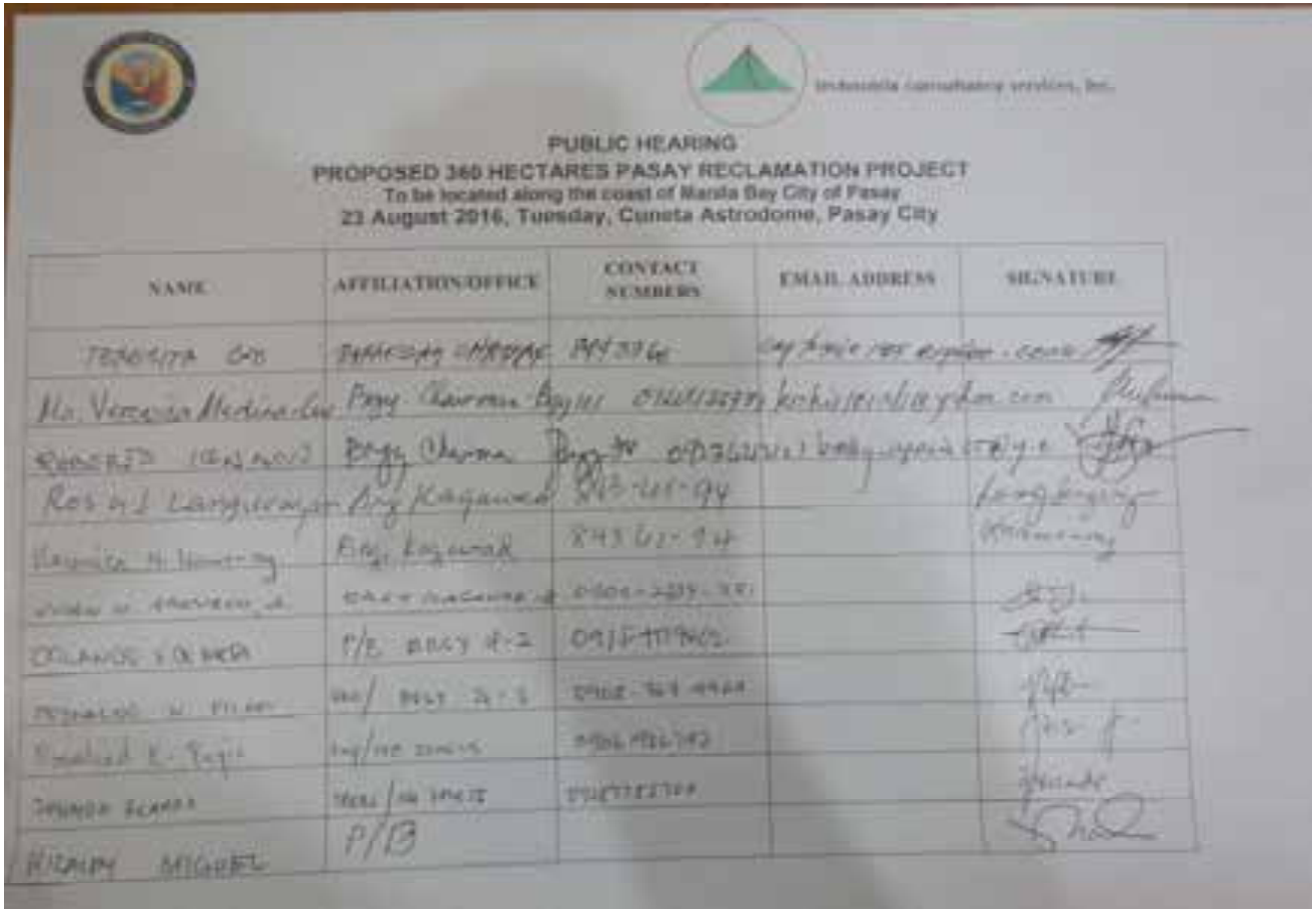
We look forward to your active participation.

Sincerely yours,

ATTY. MICHAEL DRAKE P. MATIAS
Chief, EIAM Division

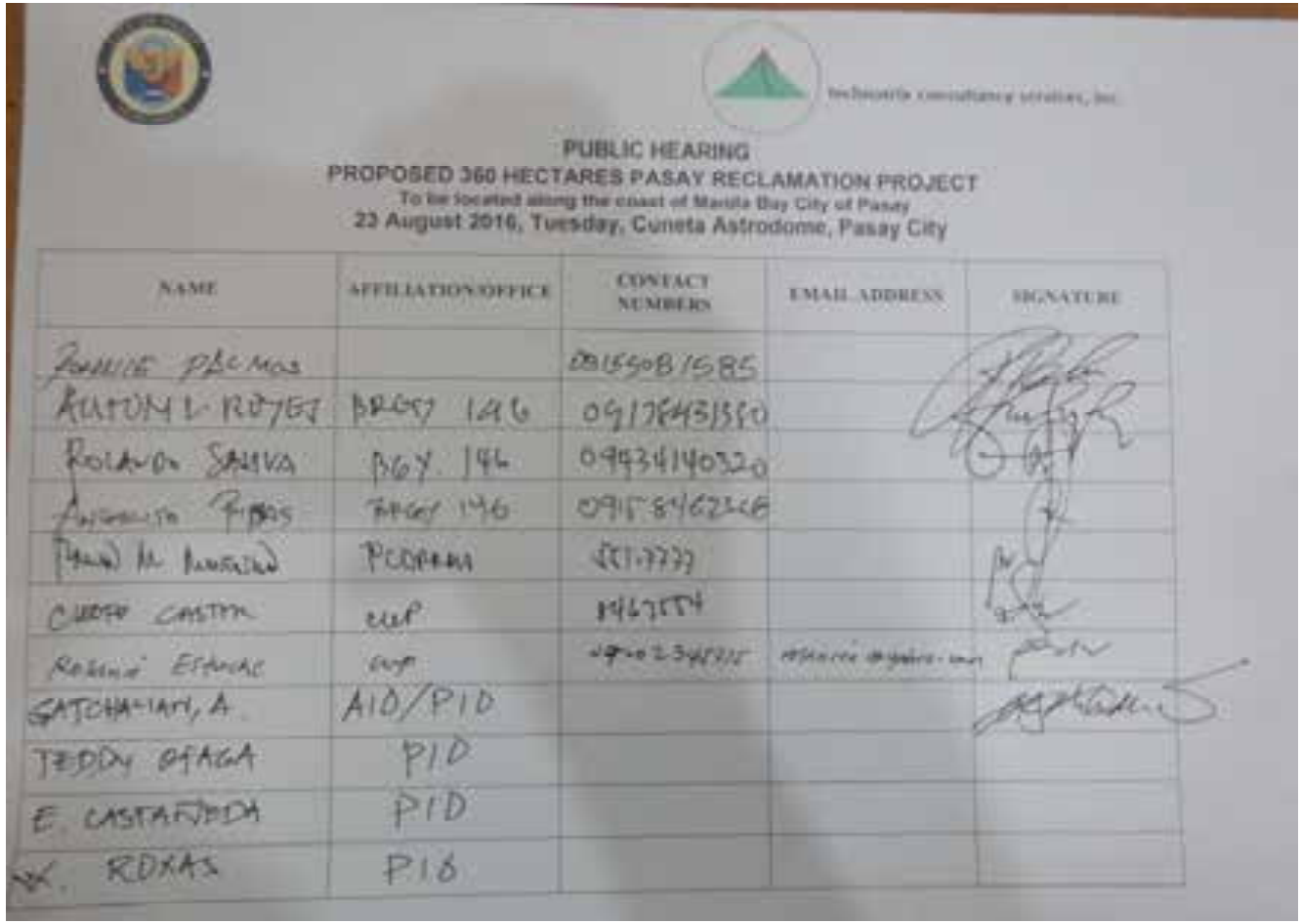
4.0 Actual Participation

The lists of the attendees are given hereunder**:**



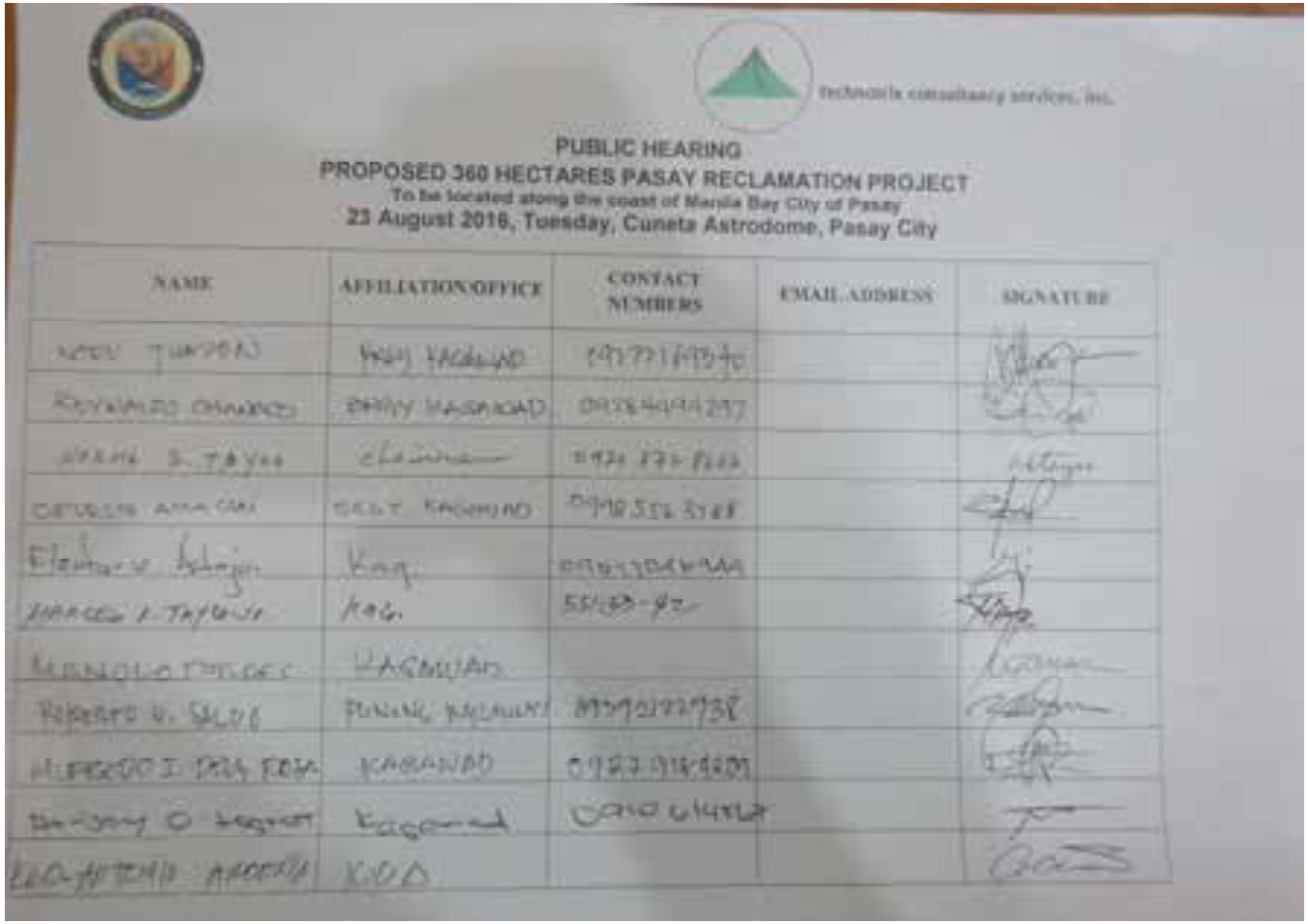
PUBLIC HEARING
PROPOSED 360 HECTARES PASAY RECLAMATION PROJECT
To be located along the coast of Manila Bay City of Pasay
23 August 2016, Tuesday, Cuneta Astrodome, Pasay City

NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
	P/B			



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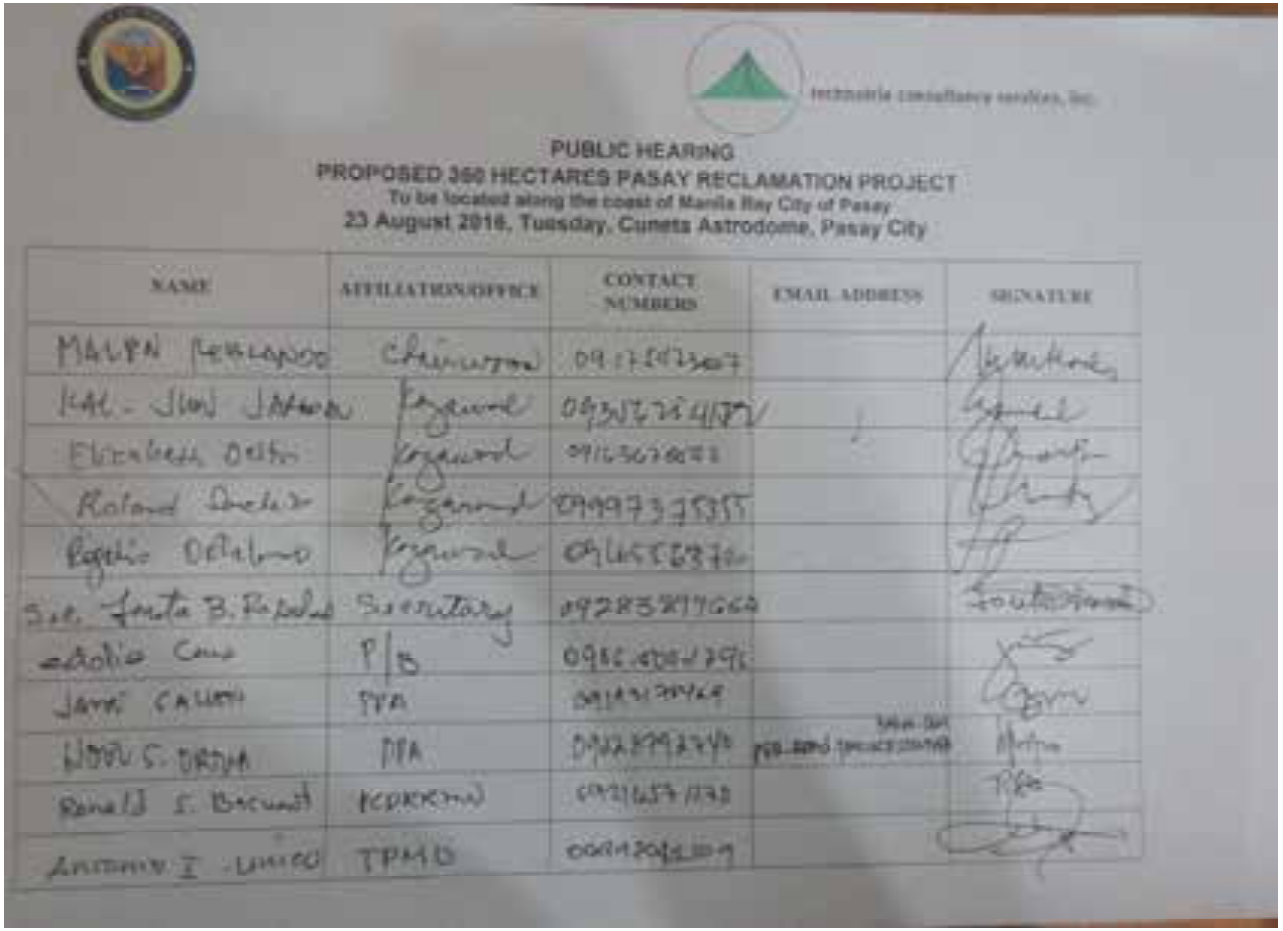
NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
[illegible]		09155081585		
ALVIN L. ROYET	BRGY 146	09178431350		
Rolando Saliva	Brgy. 146	09934140320		
[illegible]	Brgy 146	0915 8462268		
[illegible]	PCDRRM	[illegible]		
[illegible]	CLUP	[illegible]		
[illegible]	CLUP	[illegible]	[illegible]	
SATCHMAN, A.	AIO/PIO			
TEDDY OFAGA	PIO			
E. CASTAÑEDA	PIO			
K. ROXAS	PIO			



technolink consultancy services, inc.

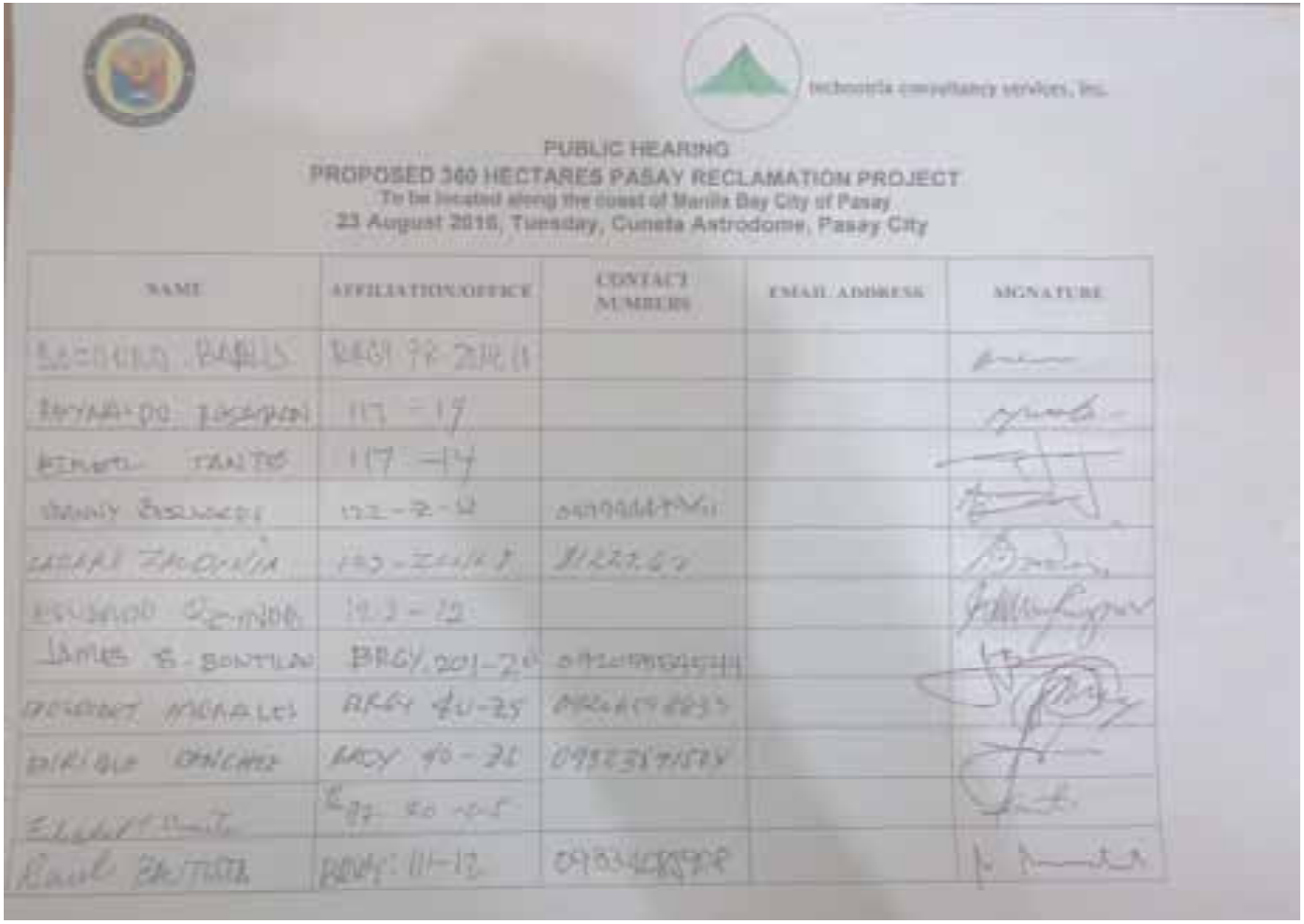
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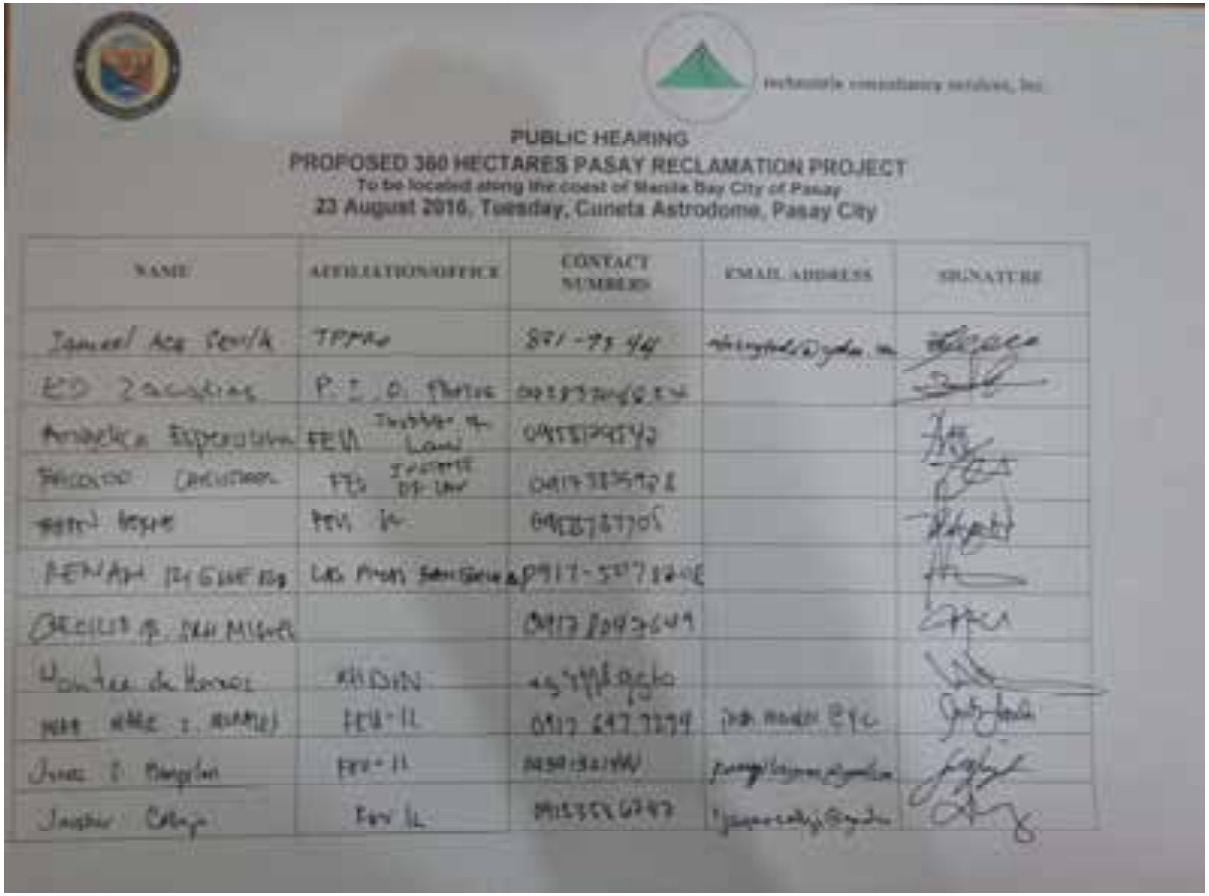
NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
MALEN [illegible]	Chairwoman	09[illegible]		
Kat. Jhon [illegible]	Engineer	09[illegible]		
Elizabeth [illegible]	Engineer	09[illegible]		
Roland [illegible]	Engineer	09[illegible]		
Rogelio [illegible]	Engineer	09[illegible]		
Sec. Jenita B. [illegible]	Secretary	09283[illegible]		
adolfo [illegible]	P/O	0956[illegible]		
Jayvi [illegible]	PPA	09[illegible]		
[illegible] S. [illegible]	PPA	09[illegible]	[illegible]	
Ronald S. Bacuno	PCDRRM	09[illegible]		
Antonio I. [illegible]	TPMD	09[illegible]		



technosta consultancy services, inc.

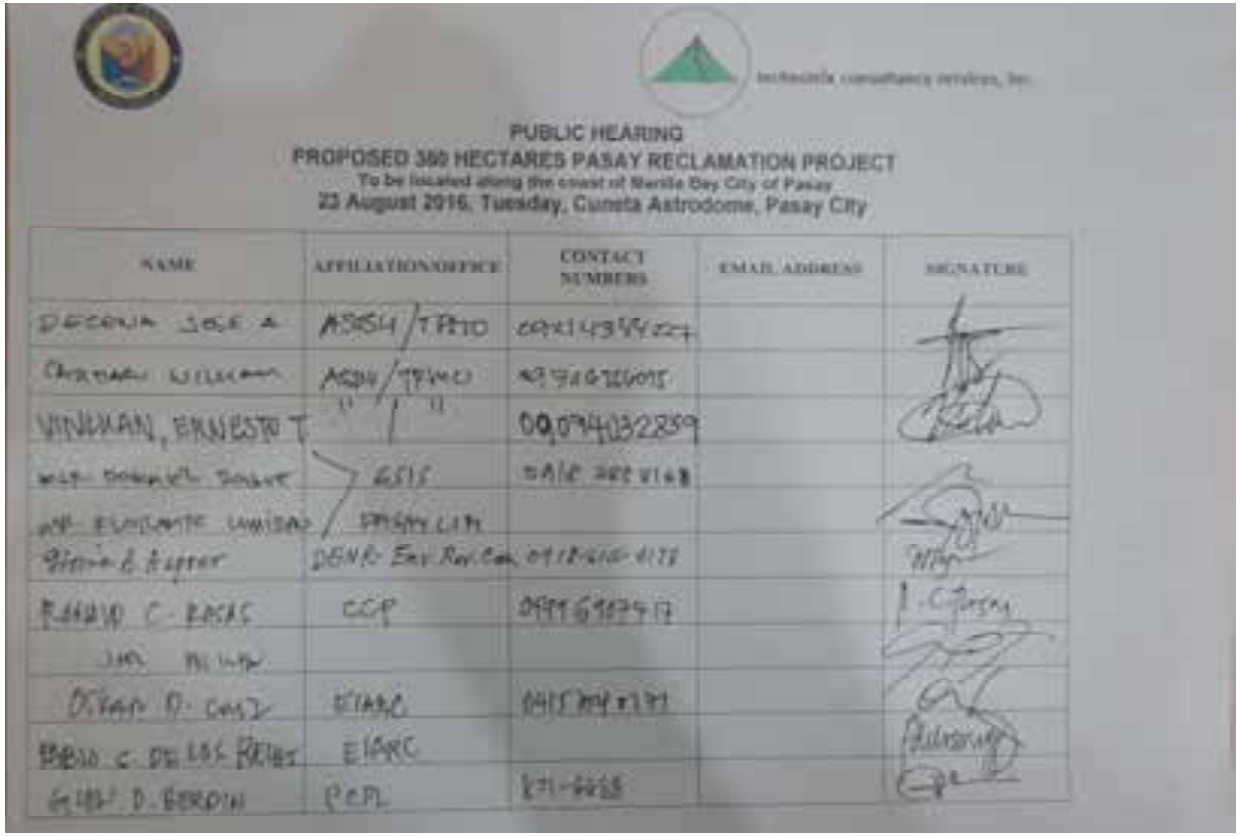
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NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
[illegible]	[illegible]			
[illegible]	[illegible]			
[illegible]	[illegible]			
[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]			
James B. Bontilao	Brgy. 201-2	[illegible]		
[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]	[illegible]		
[illegible]	[illegible]			
[illegible]	[illegible]			



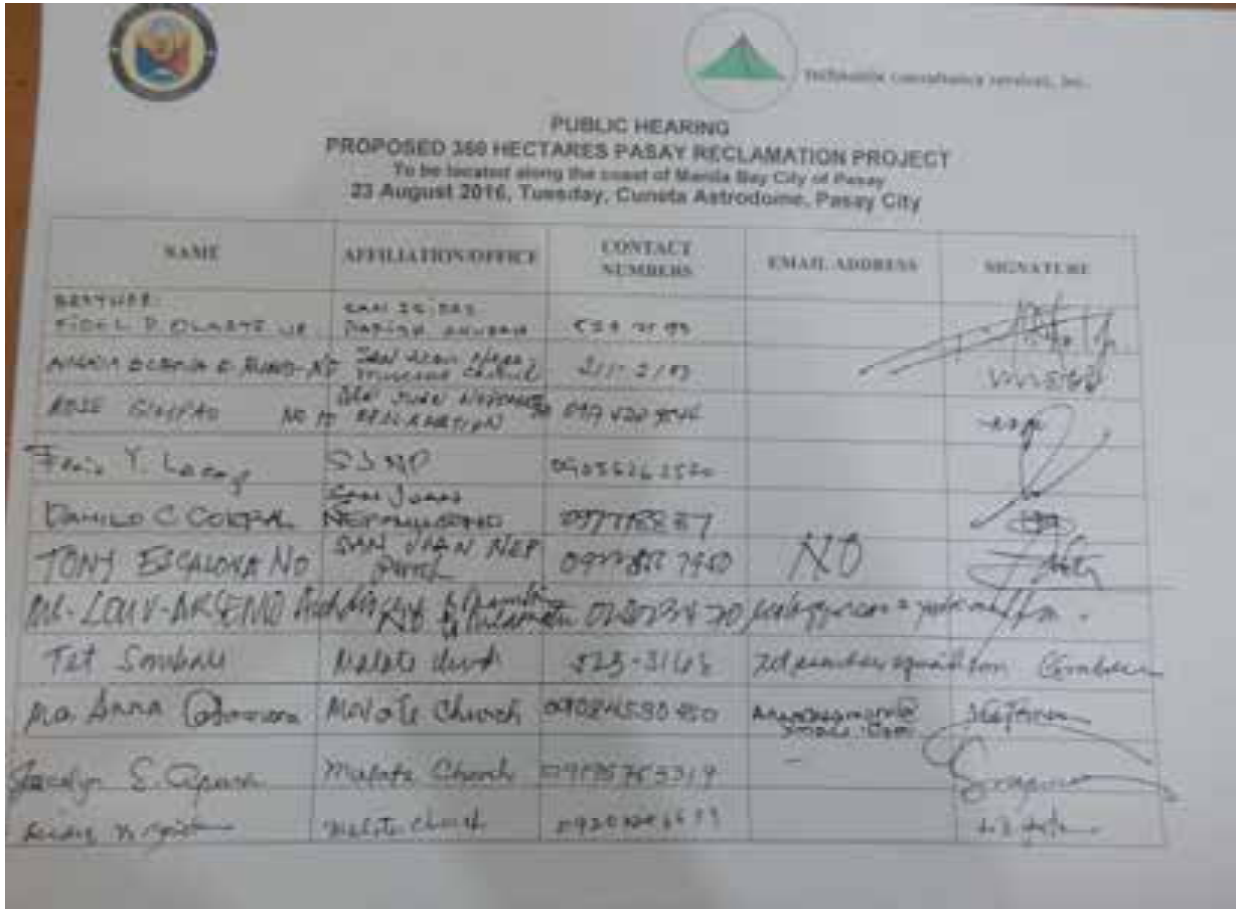
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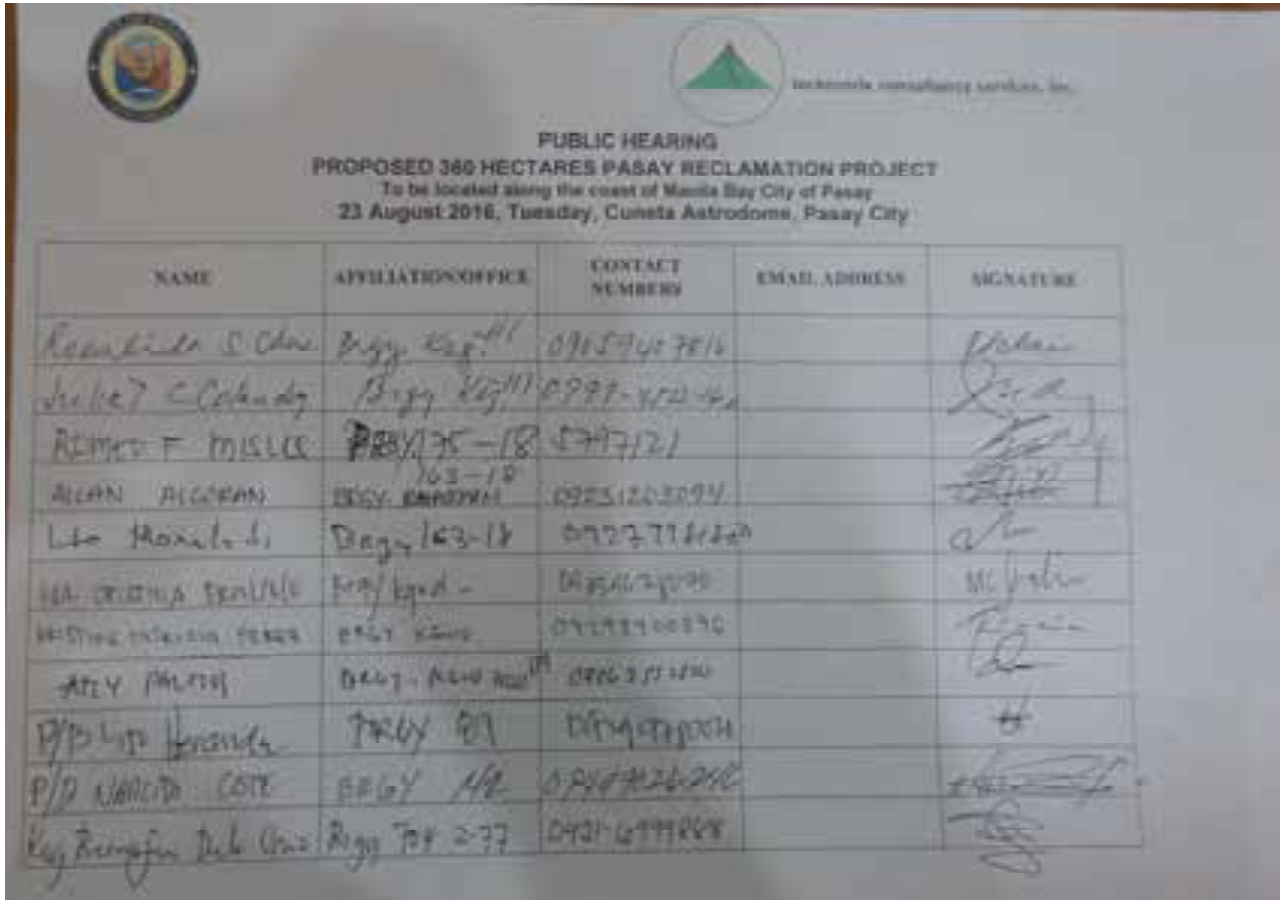
PUBLIC HEARING
PROPOSED 360 HECTARES PASAY RECLAMATION PROJECT
To be located along the coast of Manila Bay City of Pasay
23 August 2016, Tuesday, Cuneta Astrodome, Pasay City

NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
DECENA JOSE A.	ASDSO / TPRTO	09161439[illegible]27		
[illegible]	ASDSO / TPMCO	[illegible]		
VINUYAN, ERNESTO T.		09.094032859		
[illegible]	6515	[illegible]		
[illegible]	PASAY CITY			
[illegible]	DENR-Env. Rev. Off.	[illegible]		
[illegible] C. BASAS	CCP	0999 6197917		
[illegible]				
[illegible]	EIARC	[illegible]		
[illegible]	EIARC			
[illegible]	PCPL	[illegible]		



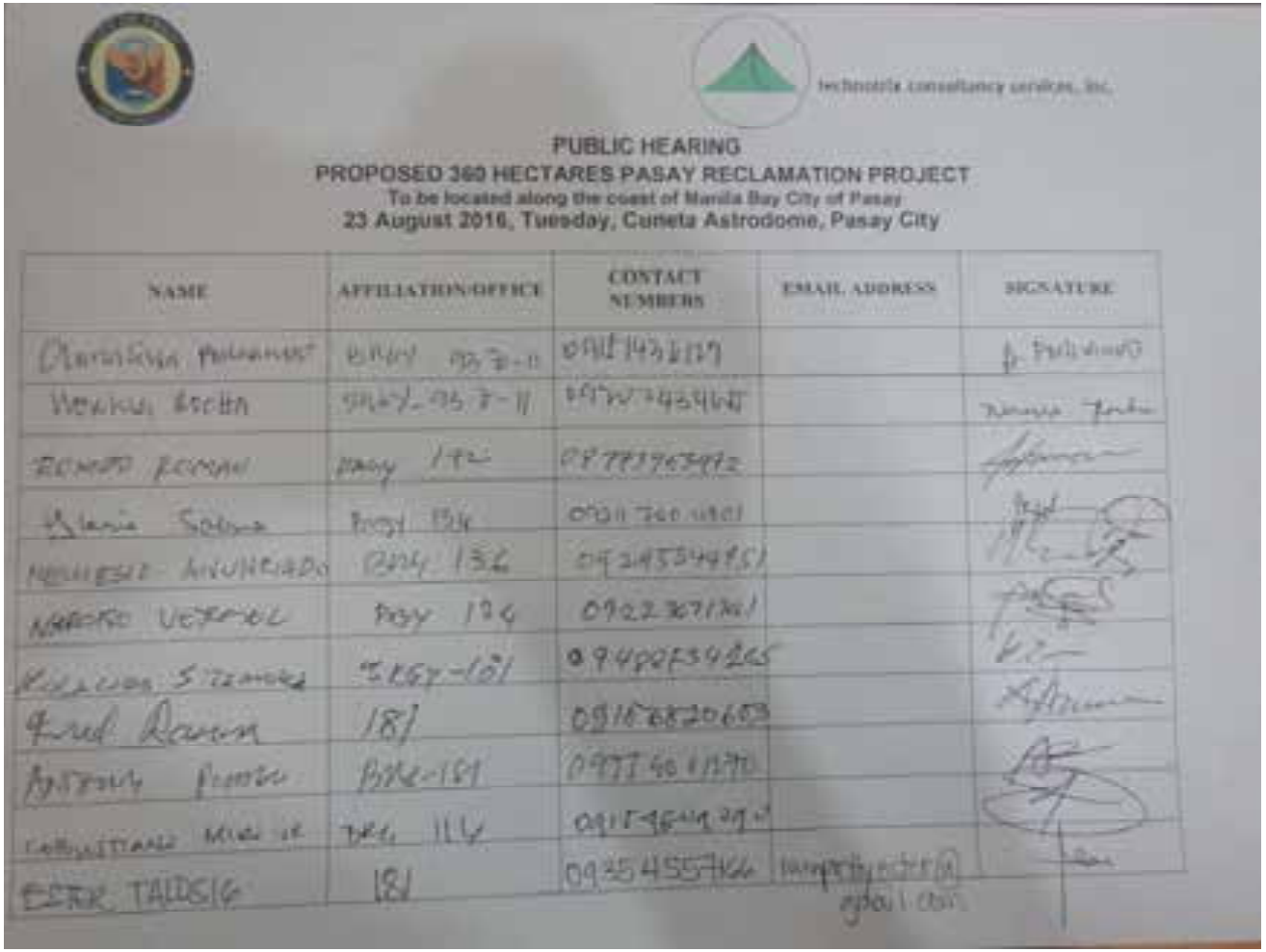
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To be located along the coast of Manila Bay City of Pasay
23 August 2016, Tuesday, Cuneta Astrodome, Pasay City

NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
TONY ESCALONA NO	SAN JUAN NEP		NO	



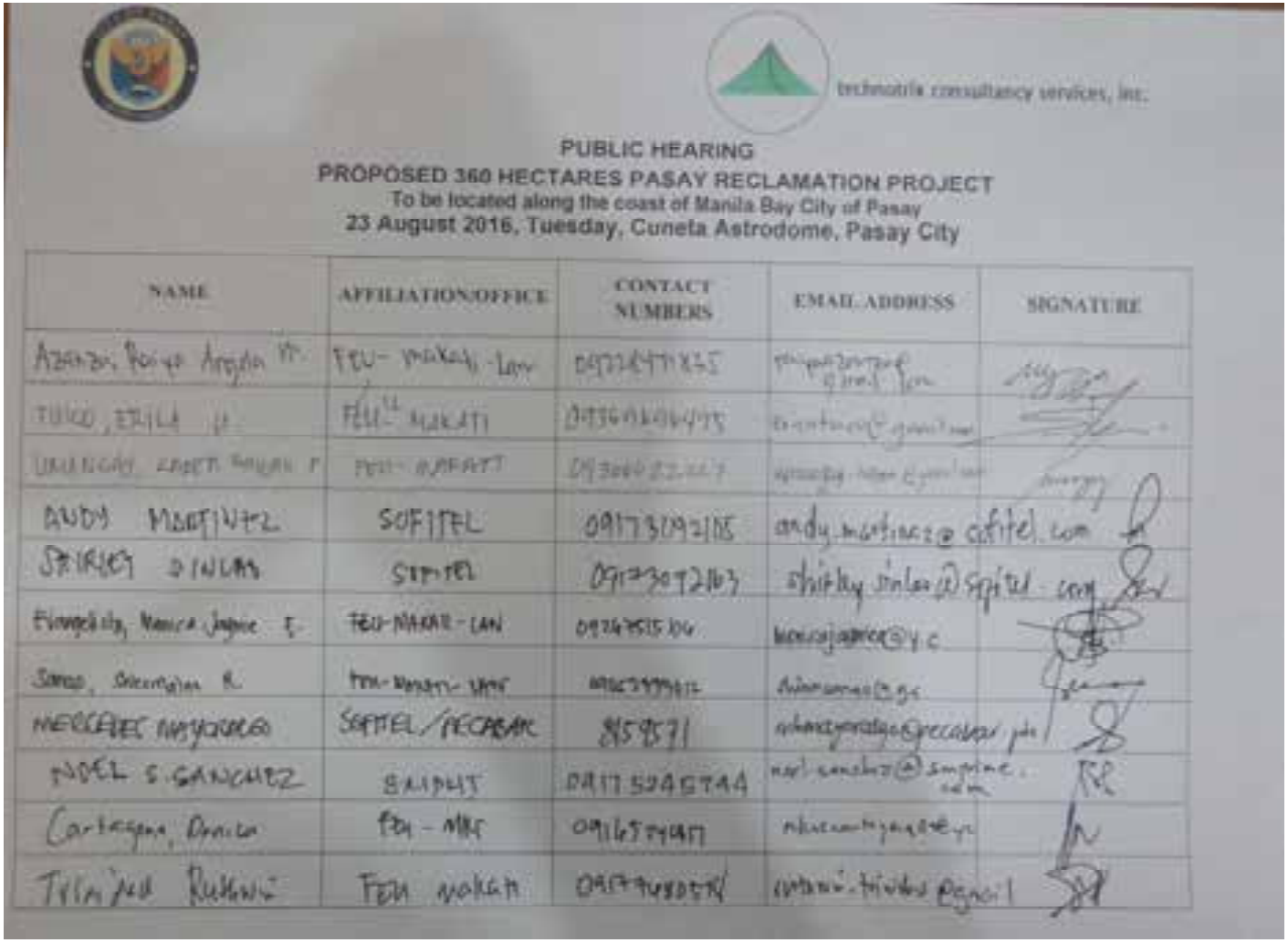
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PROPOSED 360 HECTARES PASAY RECLAMATION PROJECT
To be located along the coast of Manila Bay City of Pasay
23 August 2016, Tuesday, Cuneta Astrodome, Pasay City

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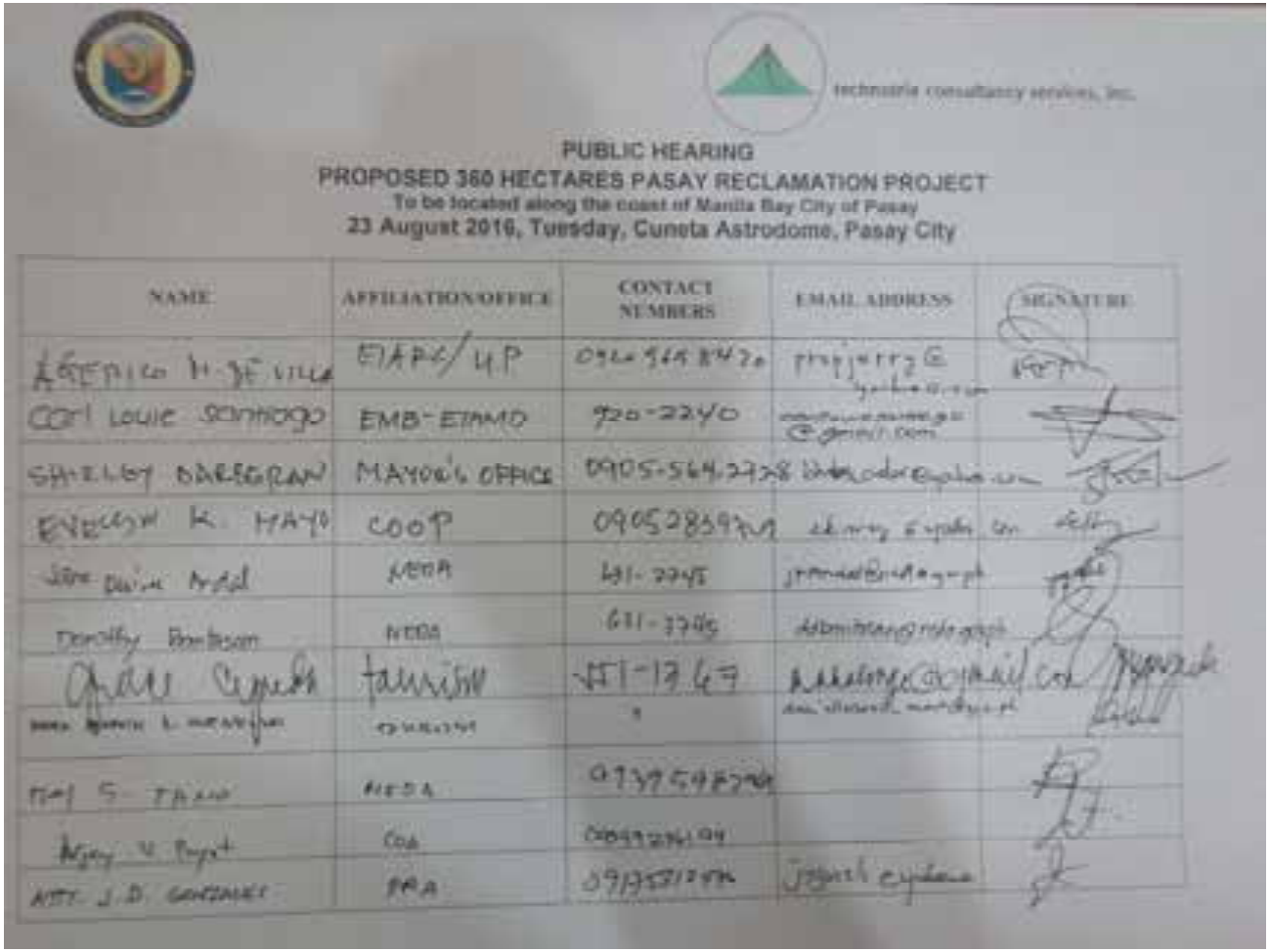
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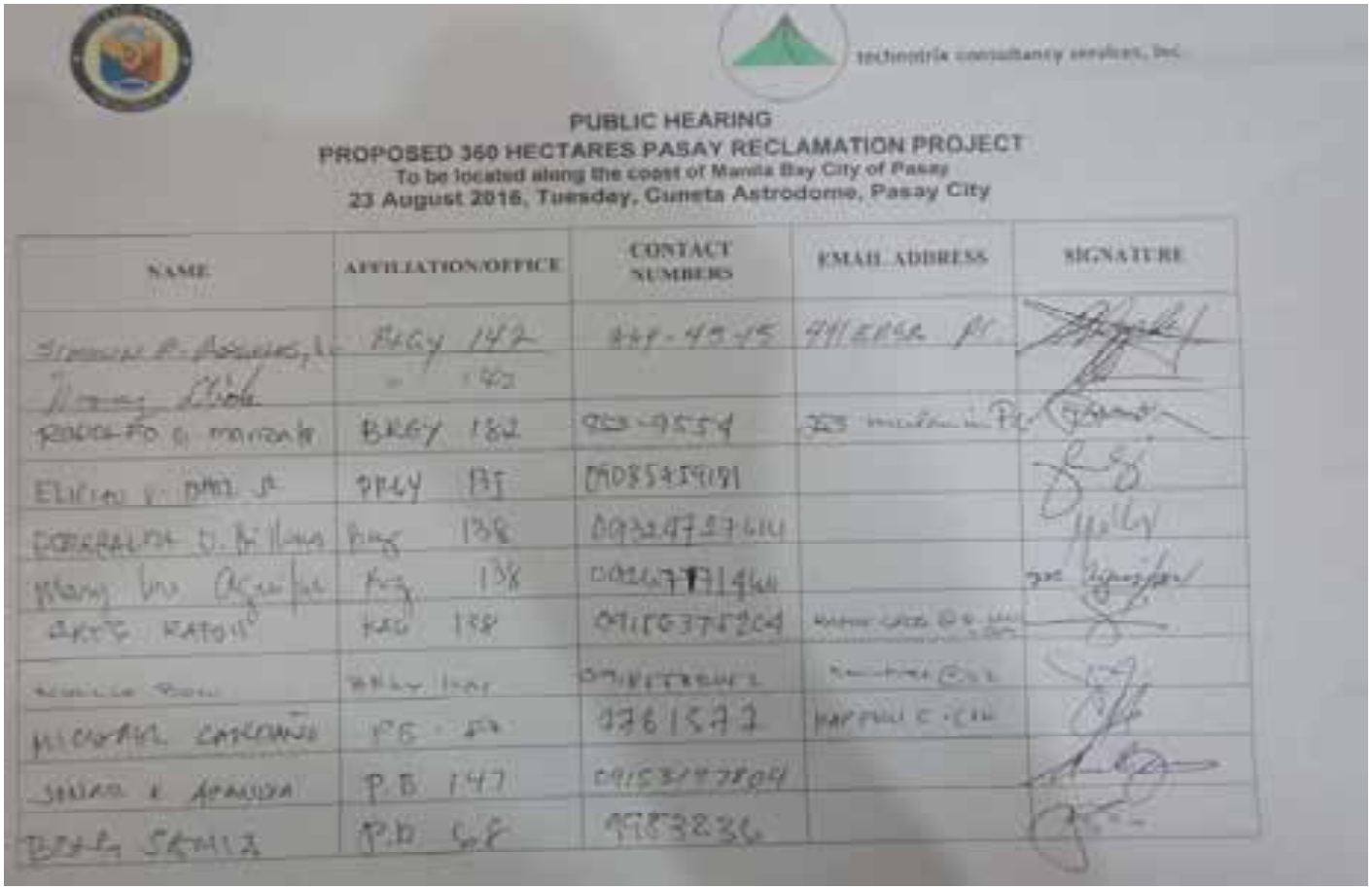
NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
Azarcon, Rocyl Angela M.	FEU- Makati - Law	09224771435		
TUICO, ERIKA P.	FEU-II MAKATI	09364869495		
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Evangelista, Monica Jaqueline E.	FEU-NRMF - LAW	09267515104		
Santos, Shiemaijan R.	FEU-Makati - Law	09163999612		
MERCEDES MAYORGA	SOFITEL/RECABAR	859871		
NOEL S. SANCHEZ	SAMPLE	09175245744		
Cartagena, Danica	FEU - NRMF	09165794471		
Trinidad Rubino	FEU Makati	09179488584		



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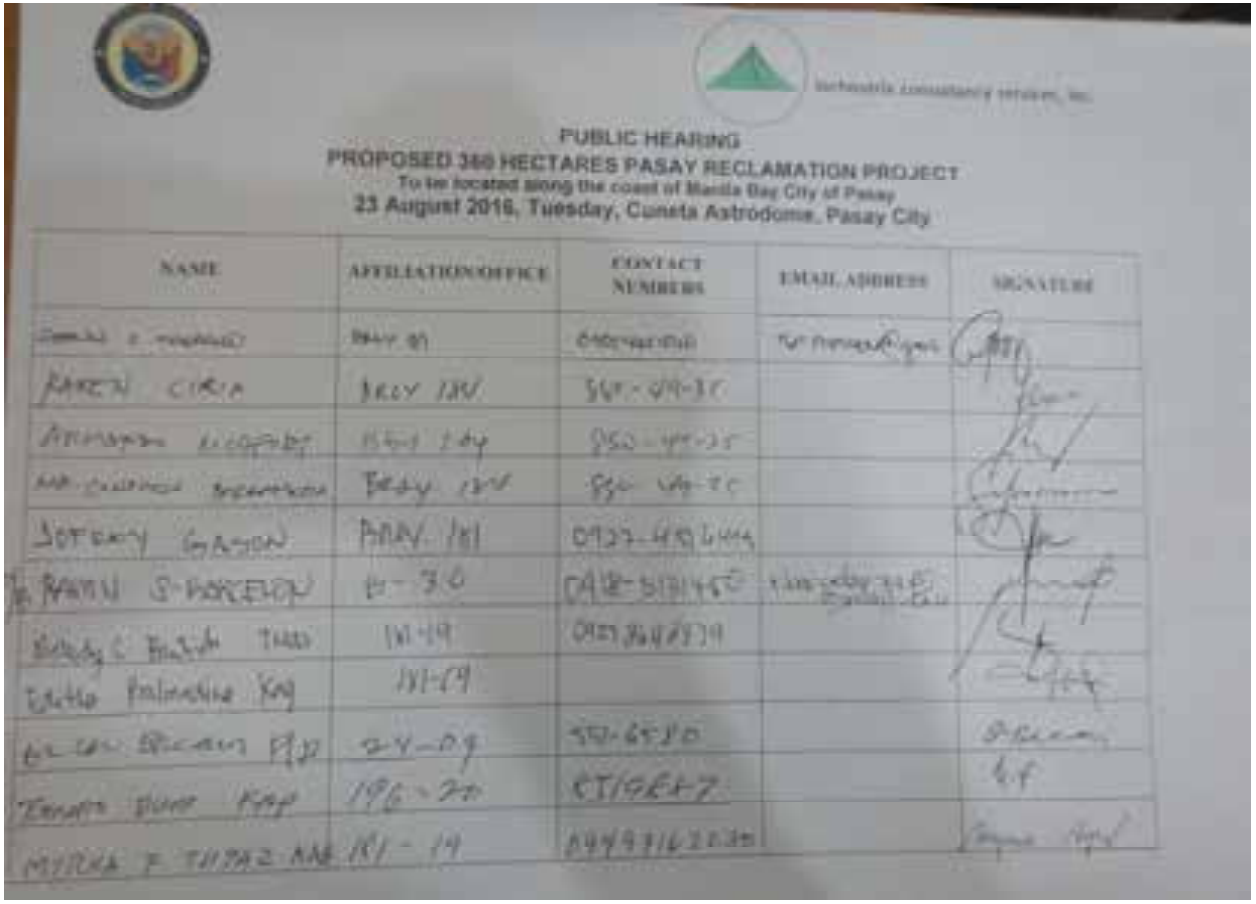
NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
[illegible]	EIAPC/UP	[illegible]	[illegible]	
Carl Louie Santiago	EMB-EIAMD	920-2240	[illegible]	
SHIRLEY BARRERAN	MAYOR'S OFFICE	0905-564-2758	[illegible]	
[illegible]	COOP	[illegible]	[illegible]	
[illegible]	NEDA	631-2245	[illegible]	
Dorothy [illegible]	NEDA	631-2245	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	NEDA	[illegible]		
[illegible]	COA	[illegible]		
ATTY. J.D. GONZALES	PRA	[illegible]	[illegible]	



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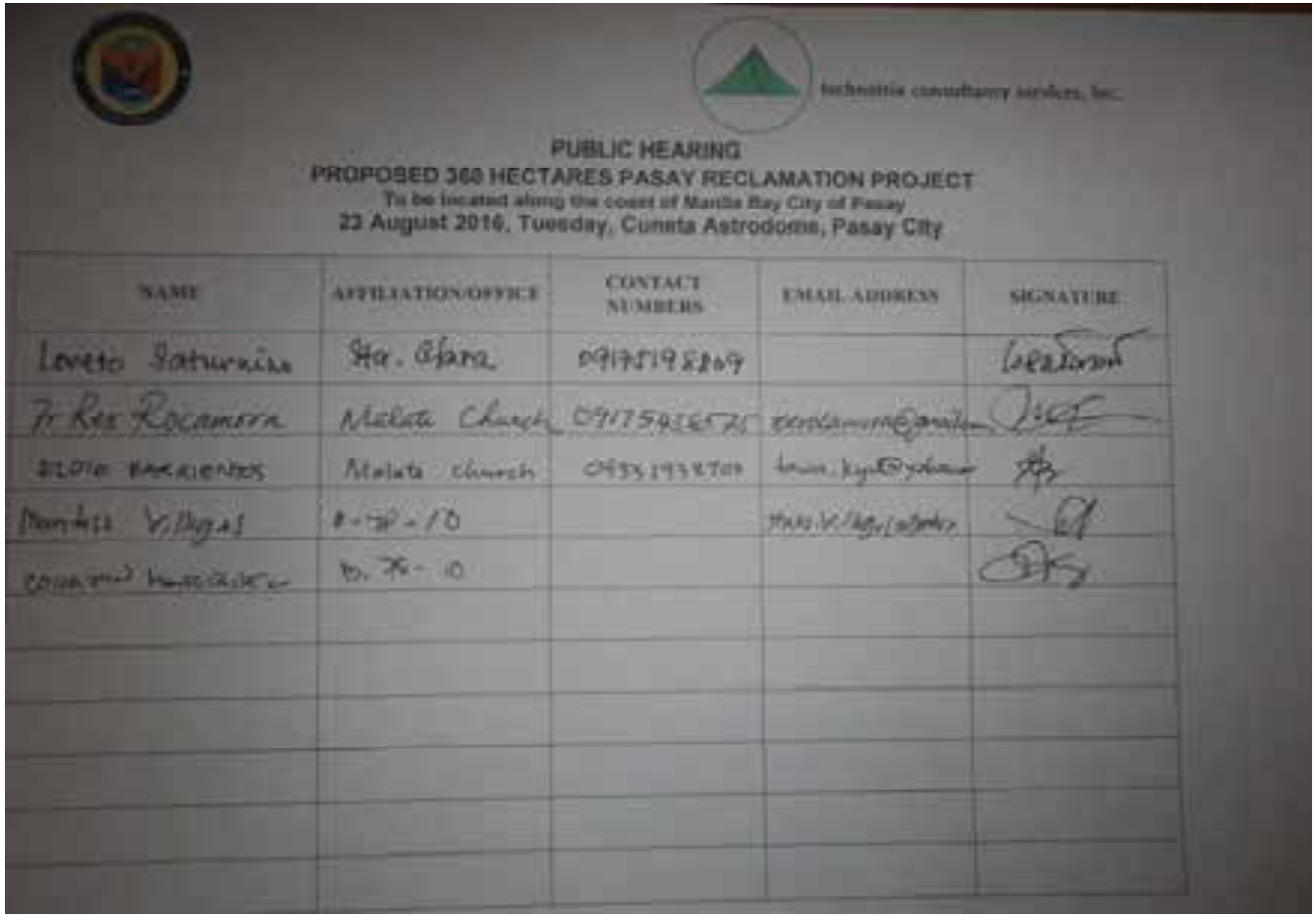
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NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
	BRGY 142			
	BRGY 182			
	BRGY 183			
	Brgy 138			
	Brgy 138			
	BRGY 138			
	P.B 147			
	P.B 68			



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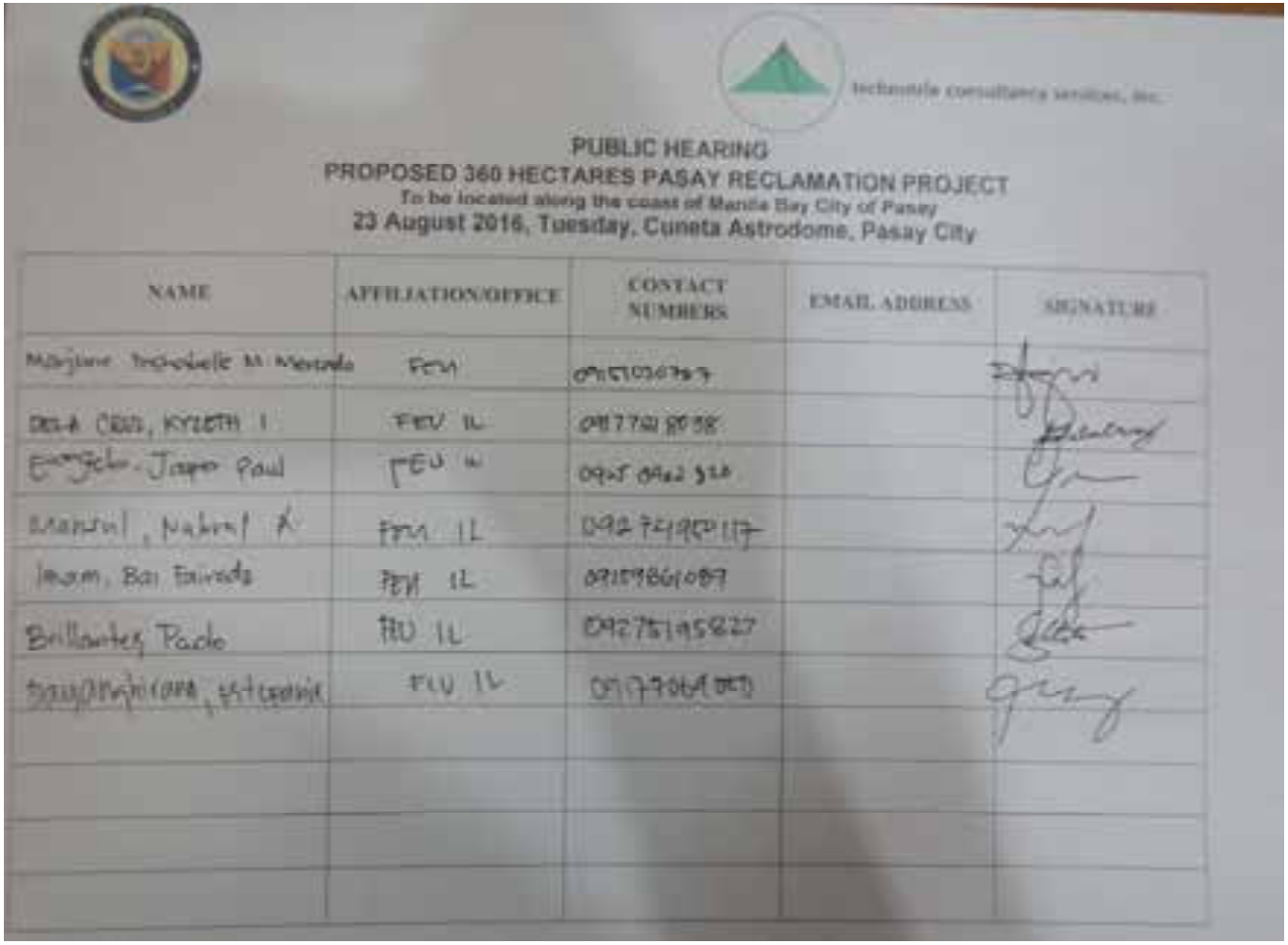
NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
KAREN CIRIA	BRGY 130	561-09-37		
JOFFREY GAMSON	PARK 181	0927-449-6443		
MYRNA F TUTAS ANB	181-19			



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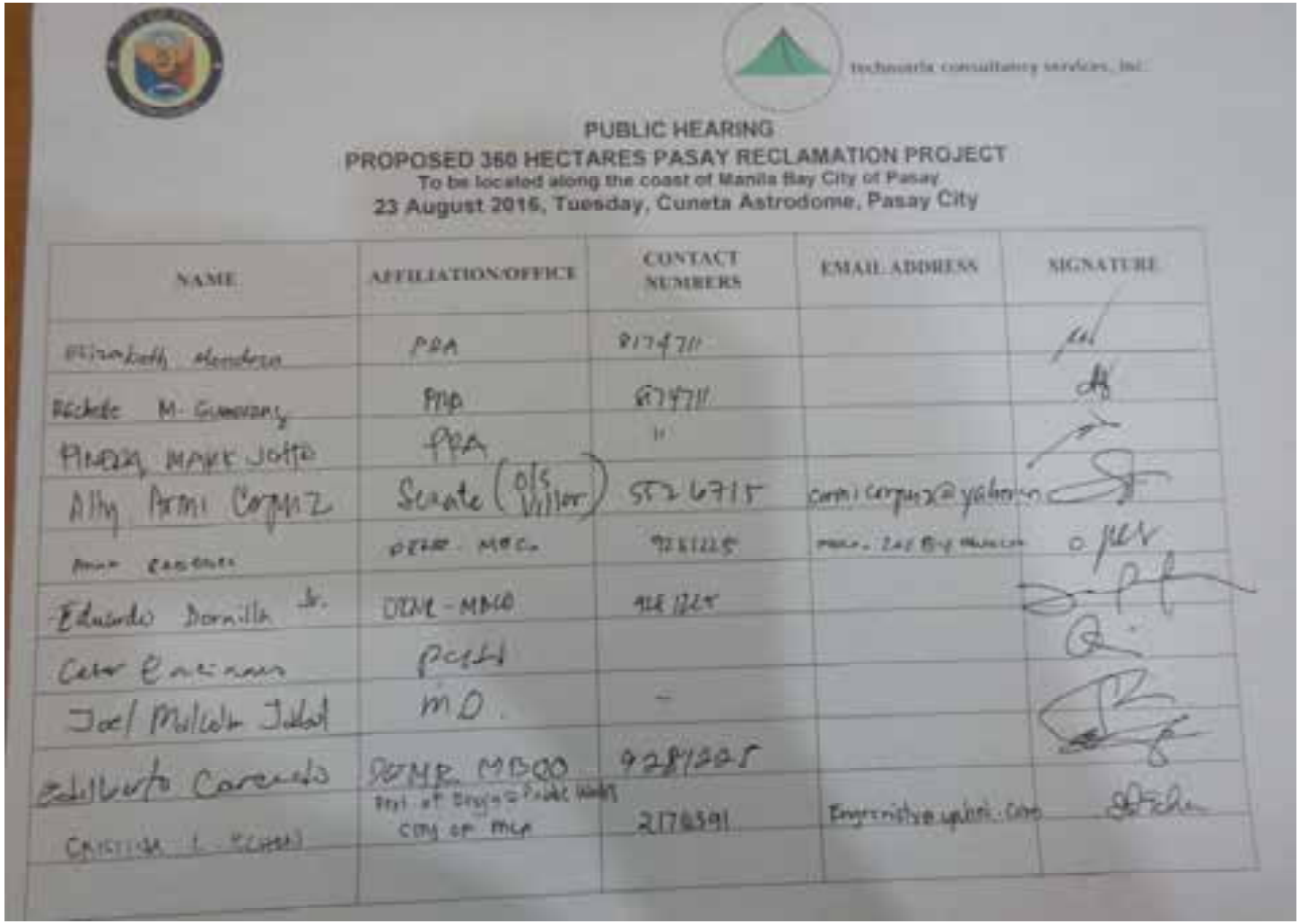
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NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
Loreto Saturnino	Sta. Clara	09175195209		
Fr Rex Rocamora	Malate Church	09175216572		
[illegible]	Malate church	09331938709		
[illegible]	8-30-16			
[illegible]	8.30-16			



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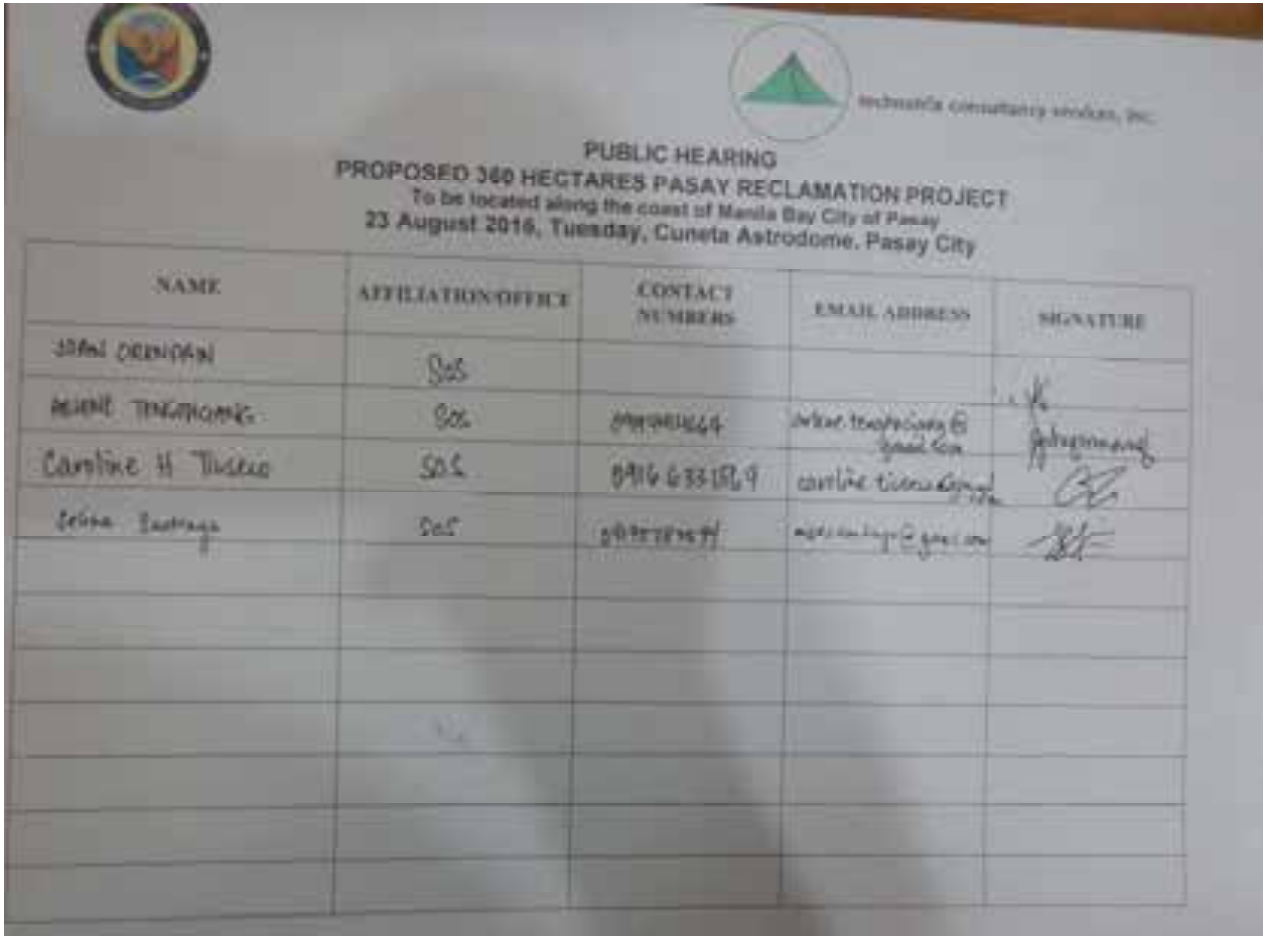
NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
Marjorie Michelle M. Mercado	FEU	09152036787		
DELA CRUZ, KYZETH I.	FEU IL	09177208058		
Evangelio, Jasper Paul	FEU IL	0945 0962 328		
Manuel, Nabral A.	FEU IL	09274195117		
Ibram, Bai Faiveda	FEU IL	09159861087		
Brillantes, Paolo	FEU IL	09275195827		
[illegible]	FEU IL	09177064[illegible]		



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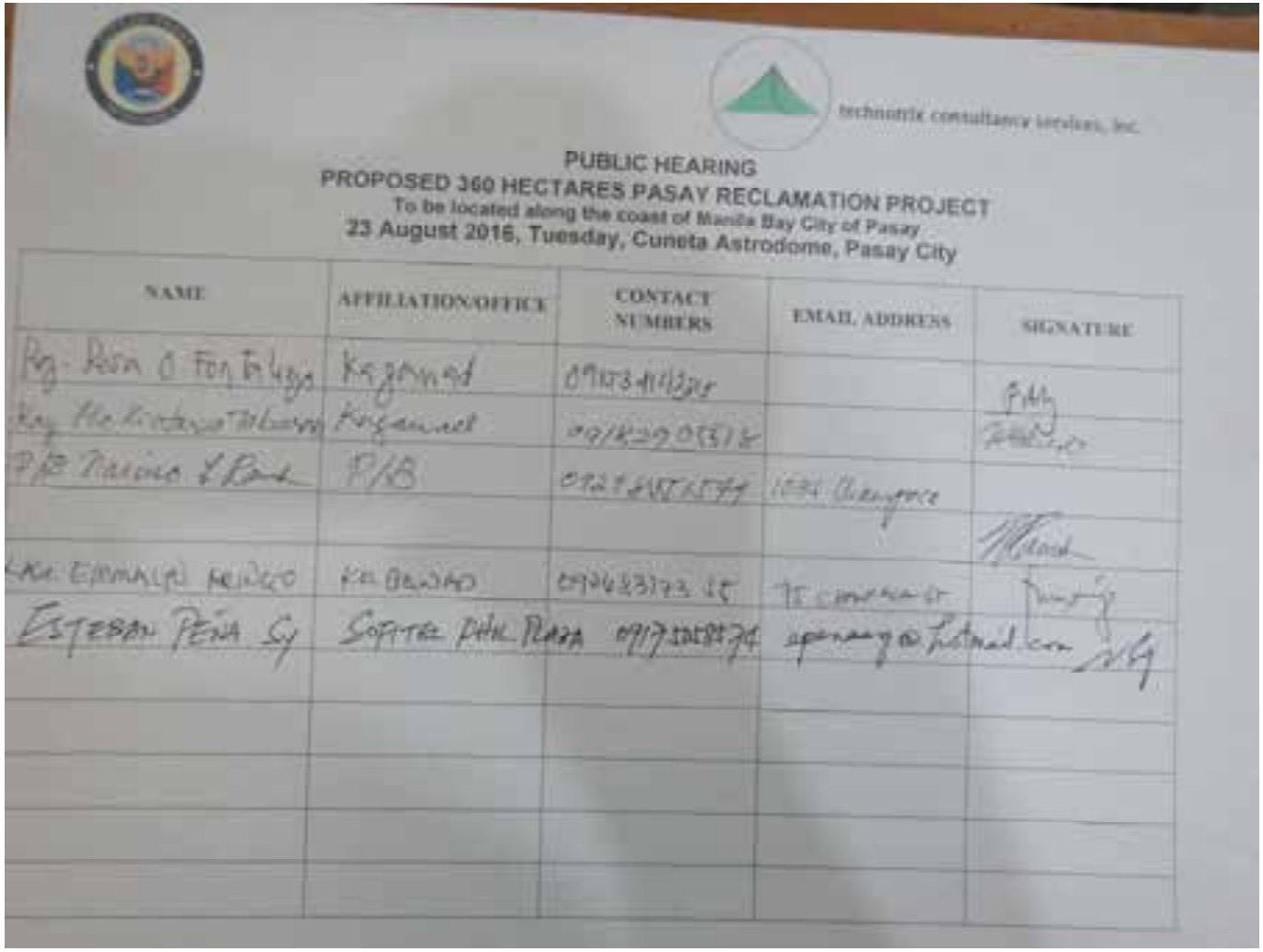
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NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
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Rechelle M. Guinoozay	PPA	8174711		
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[illegible]	DENR - MGB	9261225	[illegible]	
Eduardo Dorvilla Jr.	DENR - MGB	926 1225		
Cesar Encinas	PCGG			
Joel Melchor Jabat	MD.	-		
Edilberto Caceres	DENR MGB	928/225		
CRISTINA L. [illegible]	Port of Engineering Public Works City of Mla	2176591	Engrcristina up@yahoo.com	



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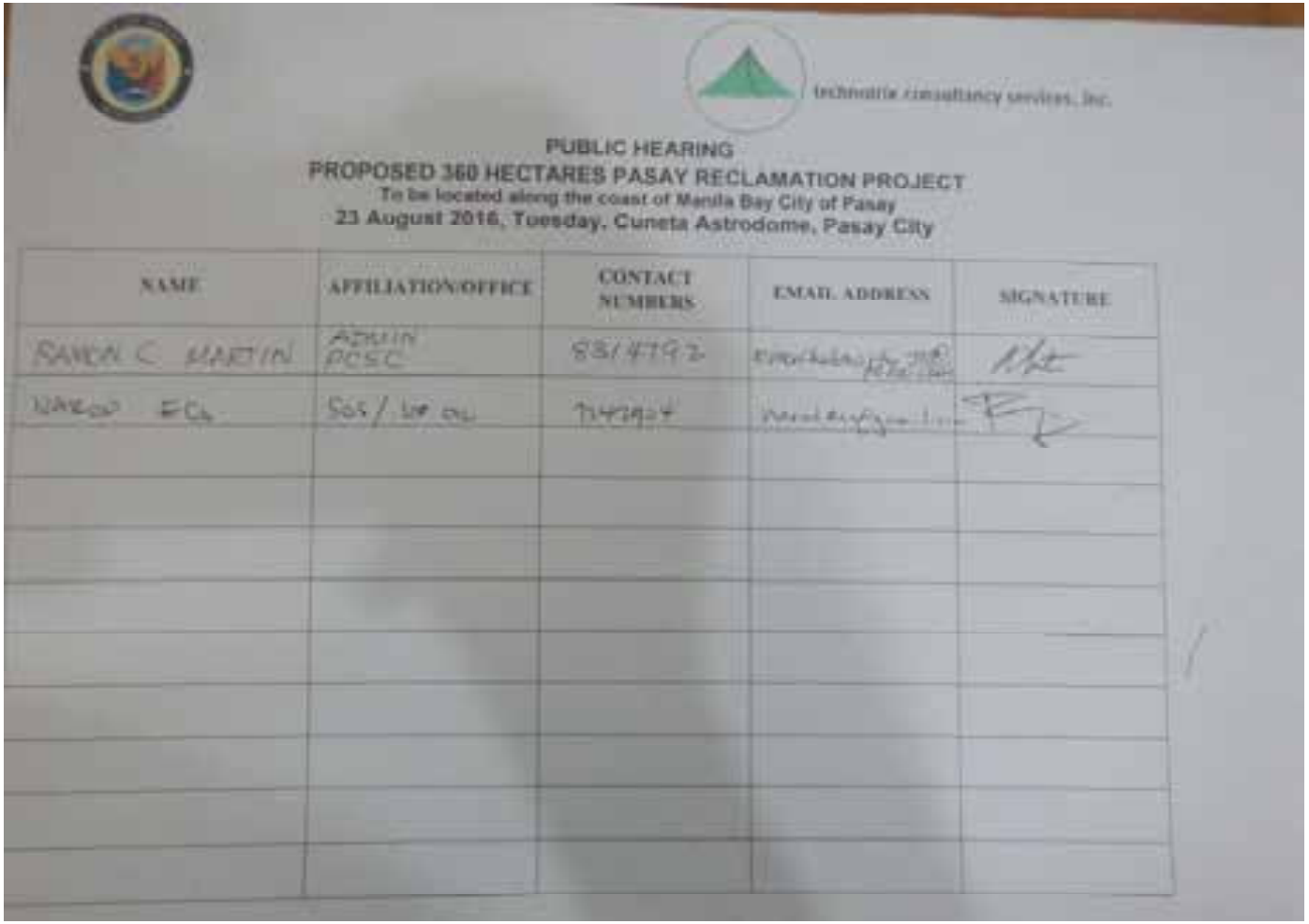
NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
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[illegible]	SoS	[illegible]	[illegible]	
Caroline H. Tinsay	SoS	0916 633 1569	caroline.tinsay@gmail.com	
[illegible]	SoS	[illegible]	[illegible]	



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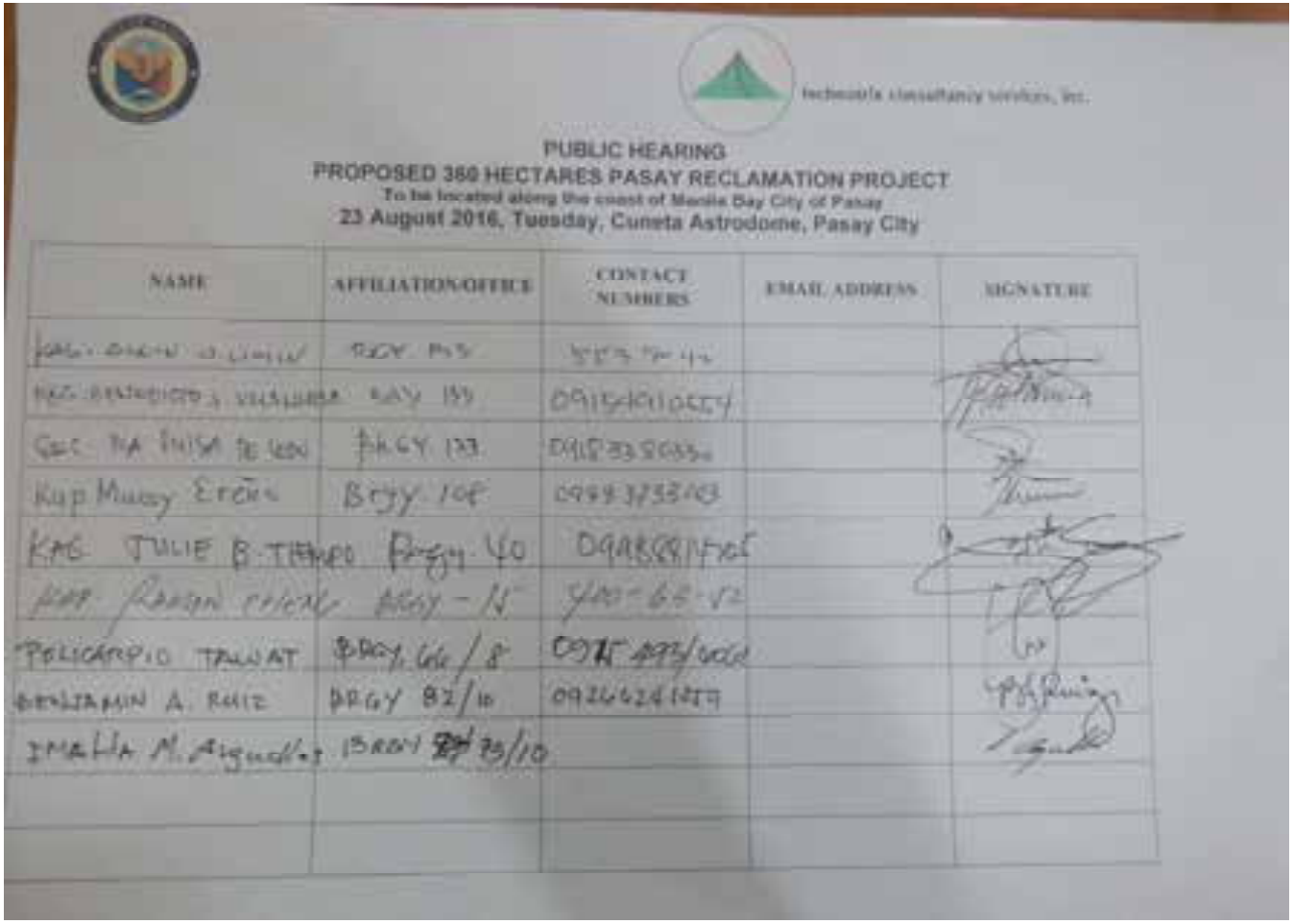
NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
Brgy. Rosa O Fortaleza	Kagawad	09153411326		
Brgy. Ma. Victoria Tolentino	Kagawad	09162900316		
PB Marina L Bank	P/B	09218487579	1034 Alexandra	
Kgd. Esmeralda Mendoza	Kagawad	09246323 15	75 Camarin St	
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NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
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NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
KAG. JULIE B. TIANGCO	Brgy. 40			
POLICARPIO TALAVAT	BRGY. 66/8			
BENJAMIN A. RUIZ	BRGY 82/10			
IMALIA M. Agustin	BRGY 79/10			

The balance of the Attendance Sheets is provided in the **Annex F.**

4.0 Report on the Proceedings

The Public Hearing allowed all questions, issues and concerns to be raised completely and freely. No time limit was set.

The Philippine EIS System ("PEISS") and purpose of the Public Hearing were explained by the EIA Casehandler for the Project and by the EIA Section Chief.

Annexes

a) **Speech of the Honourable Mayor Antonino Calixto**
b) **Presentation of the Proponent and EIA Preparer**
c) **Table of Issues and Concerns and Responses Thereto**
d) **Summary and Conclusions**
e) **Photographs of the Public Hearing**
f) **Attendance Sheets**

ANNEX A

Speech of Hon. Mayor Antonino Calixto
Public Hearing – Proposed 360-ha Reclamation Project
Cuneta Astrodome, 23 August 2016

Good morning everyone. At the outset, I wish to apologize for the cancellation last of the previously scheduled public consultation on the proposed 360 hectare Pasay City reclamation project. The cancellation was prompted by an intervening urgent concern that needed my personal attention as City Mayor.

In addition, on the eve of the scheduled hearing, we also received a letter from then Secretary of Public Works and Highways Rogelio Singson, which required further evaluation due to the issues raised by the Department, including its alleged objection to an adjacent reclamation project of the City of Manila. After verification, we found out that the DPWH actually issued a certificate of no objection dated 11 August 2015 involving the City of Manila reclamation project in Manila Bay.

We are glad that the public consultation is finally pushing through today. On behalf of Pasay City, welcome everyone.

So why this reclamation project? Why do we want to extend our land area outward of the existing MOA area? We want to do it for the simple reason-- it is the right thing to do to bring progress and development to Pasay City and its people.

With over half a million residents, Pasay City is one of the most densely populated urban centers in the country. Its total land area is barely 19 square kilometers making it one of the smallest cities in Metro Manila. Yet, it is also the premier gateway of the Philippines, hosting both the country's busiest international and domestic airports and major land transport hubs. It is also the country's leading entertainment, cultural, and tourism hub, bustling with life, 24 hours a day, 7 days a week. Thus, its acclaim as The Travel City.

Our city is fast growing. Our population is expanding. Businesses are coming in droves. More travelers are pouring in. We simply need more space – for more businesses, hotels, restaurants, convention centers, public parks, banks, BPO centers, schools, recreation facilities, religious centers, medical facilities, condominiums and tenements for residential communities. We truly need more space for progress and development.

To this pressing need for more space and development, *ang solusyon po namin diyan, ay napakasimple*. Build on the mega success story of the past reclamation projects in Pasay City. *Ito po yung kasalukuyang kinatatayuan ng SM Mall of Asia at iba pang hotels and establishments sa paligid ng MOA. Bunga rin po ng matagumpay na reclamation project yung lugar kung nasaan ngayon ang CCP Complex, Folk Arts Theater, PICC, Sofitel, Coconut Palace at GSIS Building na kasalukuyang opisina ng ating mga Senador.*

Dahil po sa mga world class hotels, shopping centers, concert and convention venues dito sa ating reclamation area, patuloy po tayong dinarayo. Dahil dito, lalong lumalakas ang turismo sa ating bansa. Nung bumisita po ang mahal na Santo Papa, si Pope Francis, pati si Pangulong Barack Obama ng Amerika at iba pang world leaders nung nakaraang APEC Summit– lahat po sila ay pumunta at namasyal dito sa ating reclamation area, at yung iba ay dito rin po sandaling nanirahan. Dahil po sa reclamation projects ay nagkaroon tayo ng world-class complex para pagdausan ng iba't-ibang malalaking events at mga okasyon.

Higit sa lahat, marami po sa ating mga kababayan dito sa Pasay ang nabigyan ng trabaho at kabuhayan. Marami din ang patuloy na nakikinabang bunga ng iba't-ibang mga proyekto na ginagawa at ipinapatupad natin ngayon, dahil sa kita mula sa reclamation project, katulad ng income sa property taxes, business permits and work permits.

Mula sa amilyar at buwis galing sa reclamation area, matagumpay nating naisagawa at patuloy na ginagawa ang mga sumusunod na serbisyo para sa taong bayan:

a) school and healthcare facilities and services;

b) medical, burial, educational assistance;
c) financial assistance to barangays and to victims of fire and other calamities;
d) balik-probinsiya program;
e) social pension and senior citizens' welfare;
f) cash gifts and financial and emergency relief assistance;
g) medical missions and emergency relief programs;
h) livelihood programs and so on.

Dagdag pa dito, ang amilyar at buwis galing sa reclamation area ay nakatulong din sa pagpondo ng mga environmental programs, katulad ng

a) Luntian Pasay Going Green and Boundary Marker Maintenance;
b) Pasay Climate Change and Risk Reduction Program;
c) Anti Littering and Garbage Stockpile Monitoring;
d) Climate Change Awareness Program;
e) Urban Renewal through Green Programs;
f) Waste Recovery Program and the Implementation of the Ecological Waste Management Act of 2000;
g) Bioreactor Service Program.

And just to give you an idea: In 2015 alone, we were able to collect about PhP3.2 billion in real property taxes, and business and work permits from the existing MOA reclamation area. What more if we could double, or even triple that amount with the proposed reclamation project? It will definitely translate to more and better services to our people.

How do we ensure this? Once the project is finally approved for implementation, the City shall adopt an ordinance to devote at least half of the business and property income from the reclaimed area for social services, livelihood, and pro-poor programs.

Moreover, we shall also devote at least 25 percent of the income generated from reclamation to environmental projects, including the cleanup of Manila Bay pursuant to existing regulations and policy directions.

Alam ko, may iilan sa atin na may pangamba sa kaligtasan ng ating reclamation project. Simple lang din po ang aming sagot sa inyong pangamba. Subok na subok na po ang tibay ng reclamation dito sa Pasay. Ilang dekada na ang nakaraan. Dumaan na ang matitinding lindol, bagyo, baha sa Metro Manila, ngunit nanatiling matibay at ligtas ang ating reclamation projects dito sa Pasay. Ang CCP Complex *na itinayo noong dekada 70 or* 40 years ago, at ang SM MOA Complex na itinayo noong dekada 90 or more than 20 years ago *ay patuloy na ligtas at dinadayo ng milyon-milyong tao bawat taon*. *Kahit nga si Pareng Barrack Obama ng Amerika nung bumisita sa Pilipinas, dito pa natulog sa ating reclamation area. Hindi pa ba sapat na patunay yan, kung gaano kaligtas ang ating reclamation?*

At doon naman sa mga may pangamba sa maaring epekto ng reclamation, lilinawin ko lang po. Wala pong mapeperwisyong kababayan natin o lamang dagat. Wala pong nahuhuling isda diyan sa baybayin malapit sa MOA kaya wala po tayong mapeperwisyo na lamang-dagat man o kabuhayan ng ating mangingisda. Doon pa po sa laot nakakahuli ang mga mangingisda, pero gagawin po nating convenient sa kanila na mabenta ng mas mabilis at sa magandang presyo ang kanilang mga mahuhuli dahil magtatayo tayo ng isang fisherman's wharf malapit sa reclamation area.

Let me leave you with this: *kapag natapos ang proyektong ito, ang nakikita ko ay isang maunlad, masagana at makabagong lungsod sa loob ng Pasay City na maipagmamalaki sa buong mundo.*

We have been elected to lead and look after the welfare of Pasay City and its people. And that is exactly what we are doing through this project. Pasay City needs this reclamation project to meet the demands of development now and in the future. And we shall undertake this project at no financial burden to the government.

Finally, we assure everyone that the Pasay City government and its development partners will undertake this project with full transparency and in compliance with all existing laws and regulations. *Umaasa po kami sa inyong*

patuloy na suporta at pananalig. Maraming salamat po at magandang umaga. **END**

ANNEX B

PUBLIC HEARING

PROPOSED 360 HECTARES RECLAMATION PROJECT
LOCATED ALONG COAST OF MANILA BAY, PASAY CITY

23 AUGUST 2016 9:00am
Cuneta Astrodome, Pasay City

PROJECT INFORMATION

ITEM	PROJECT INFORMATION
• Project Title	**PROPOSED 360 HECTARES RECLAMATION PROJECT**
• Location	**Along Coast of Manila Bay, Pasay City**
• Project Classification & Type	**Major Reclamation Project ≥ 50 hectares**
• Proponent	**Local Government of Pasay City**
• Est Project Cost	**Php 53.9 Billion**

PROJECT RATIONALE

- City's limited land area already built up and developed. Project an opportunity **for further land expansion.**

- Economic growth, promote well-being of the people of Pasay and adjacent communities.

- Direct and indirect employment; livelihood opportunities; poverty alleviation.

PROJECT RATIONALE

	LAND AREA	POPULATION/DENSITY
CITY OF MANILA	3,597	**1,652,000(2010)**
PARANAQUE	4,000	**637,434** (2013)
PASAY CITY	**1,850**	**416,522** (2015)

LOCATION OF THE PROPOSED PROJECT

1. Cultural Center of the Philippines
2. Coconut Palace
3. Philippine Sofitel
4. PICC
5. GSIS
6. J.W Diokno Blvd
7. Mall of Asia
8. Diosdado Macapagal Blvd



MAJOR COMPONENTS

COMPONENTS	GENERAL DESCRIPTION
RECLAIMED LAND	
ROADS AND OPEN SPACES	30 %
DEVELOPABLE AREA	**30 % DONATED TO PASAY** 70 % DEVELOPER
ISLANDS	
SOUTHERN ISLAND	60 HECTARES
NORTHERN ISLAND	300 HECTARES
PLATFORM	**4.0 M ABOVE MLLWL**
WATER CHANNELS	200 METERS WIDE
ACCESS BRIDGES	300 HAS : 200 – 1,000 M 60 HAS : 200 – 400 M

MAJOR COMPONENTS

COMPONENTS	GENERAL DESCRIPTION
VERTICAL CONTAINMENT STRUCTURE	9615 M LENGTH AROUND RECLAMATION ROCK MOUNDS
WAVE DEFLECTOR	CONCRETE
FILL MATERIALS	100 M CU.M.
ROCKS	12 M CU.M.

SUPPORT FACILITIES

- DRAINAGE SYSTEM
- ELECTRICITY WATER & COMMUNICATIONS
- POLLUTION ABATEMENT
- INTERNAL STREET LIGHTING
- ACCESS WAYS

PRELIMINARY CONCEPTUAL MASTER DEVELOPMENT



PROPOSED PASAY RECLAMATION
PRELEMINARY CONCEPTUAL MASTER DEVELOPMENT PLAN

SOURCE OF DREDGE FILL MATERIALS

- **Primary : San Nicolas Shoal (SNS)** with deposit 300 million cubic meters and self-replenishing

- An alternative source: lahar deposit in Pampanga and Zambales

SOURCE OF DREDGE FILL MATERIALS



EMPLOYMENT OPPORTUNITIES

- **CONSTRUCTION PHASE**

  An estimated **100 - 500 persons** during the peak construction stage.

- **OPERATION PHASE**

  2,116,800 employees are expected to be hired.

KEY RESULTS OF THE ENVIRONMENTAL IMPACT STATEMENT (EIS) REPORT

technotrîx consultancy servîces,înc.
Suite 305 FMSG Building #9 Balete Drive, New Manila, Quezon City
Telefax No. 416 4625
Email: technotrixinc@gmail.com;edalabastro3@gmail.com

IMPACT AREAS

DIRECT AND INDIRECT IMPACT AREAS

Rationale	Impacts	Sites
Direct Impact Area		
Natural Risks (Floods)	Perceptions of Flooding Caused by the Project	Libertad Channel Up to Its Discharge Mouth
Impact on Manila Bay	Change in oceanography	360-hectare sites
	Potential for Silt Dispersal	Within and immediate vicinity of the project sites

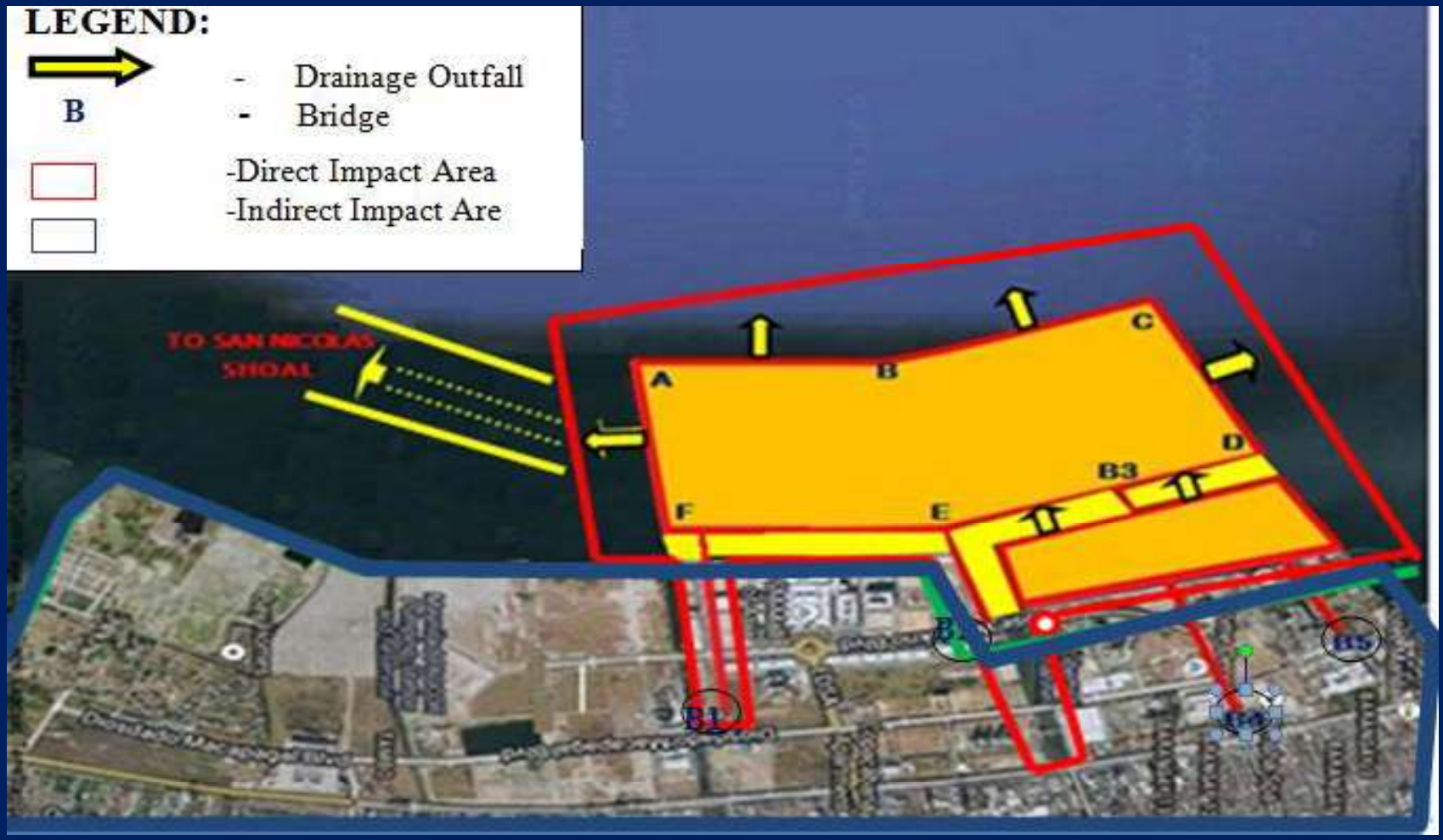
DIRECT AND INDIRECT IMPACT AREAS

Indirect Impact Areas		
Access Road	Traffic	Nearest roads
Business Competition	Competition with Small Establishments	Current location of small establishments
Dredging Vessel	Oil Spills	Along the navigational lane to San Nicholas Shoal

DIRECT AND INDIRECT IMPACT

Rationale	Impacts	Sites
Social and Perceptions (Social Impact Areas)		
Access to Fishing Grounds	NO SIGNIFICANT FISHES IN RECLAMATION SITE	
Perceptions: Floodings	Clogged Esteros not Reclamation Cause of Floods SHELTERING EFFECT VS STORM SURGES CIRCULATION EFFECTS	OUTSIDE OF PROJECT SITE
Small Businesses Along Manila Bay	COMPETITION	ALONG MANILA BAY OUTSIDE OF PASAY CITY

IMPACT AREAS AND THE BUFFER ZONES



ECC IS ONLY A PLANNING TOOL

DUE PROCESS IS A REQUIREMENT OF GOOD GOVERNANCE

e Department of Environment and Natural Resources presents its position on the mining project in Mindoro as gards the following issues raised in an earlier paid advertisement in this paper and subject also of an on-going demonstration in front of DENR premises.

ECC IS A PLANNING TOOL, NOT A PERMIT

recognition of the LGUs' moratorium on mining.

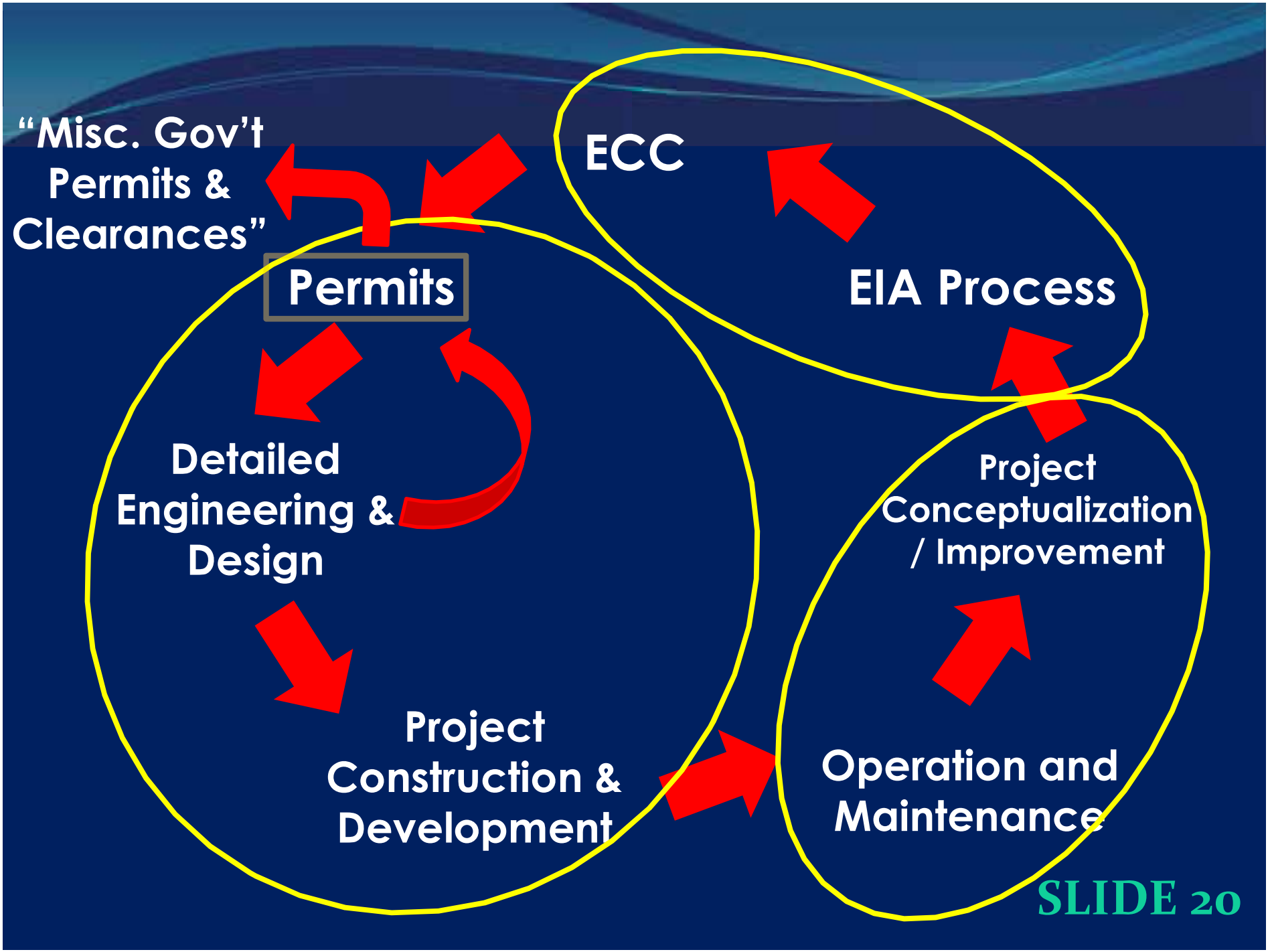
- The DENR recognizes the moratorium, b[illegible]his is a separate issue. Based on PD1586, the DENR, through the ECC, is mandated to assess the environm[illegible]tal impacts of an environmentally-critical project and prescribe mitigating measures to address these pr[illegible]identified impacts, regardless of any existing moratorium.

  The DENR stresses: (a) ECC is a planning tool, not a permit. It is supposed to guide the LGUs and other concerned agencies in the issuance of their permits; and (b) The LGU is responsible for upholding the local moratorium.

failure of Intex Resources to conduct genuine consultations in the affected communities.

- DENR officials claim that they conducted public hearings in the municipalities of Pola and Mamburao, while Intex Resources conducted consultations and public scoping sessions in the areas of Calapan, San Teodoro, Victoria, Pola, and Sablayan, where the affected communities are located. These consultations/hearings were conducted to generate environmental concerns of the community, not social acceptability.

steadfast refusal of LGUs to allow the entry of Intex Resources in the areas.


"Misc. Gov't Permits & Clearances"
ECC
Permits
EIA Process
Detailed Engineering & Design
Project Conceptualization / Improvement
Project Construction & Development
Operation and Maintenance
SLIDE 20

ECC

Permits

Detailed Engineering & Design

During Engineering Design (DED) stage, which is post-ECC the……measures identified during the EIA study…….will now be detailed based on the project facility design and operational specifications.

COVERAGE OF PROJECT

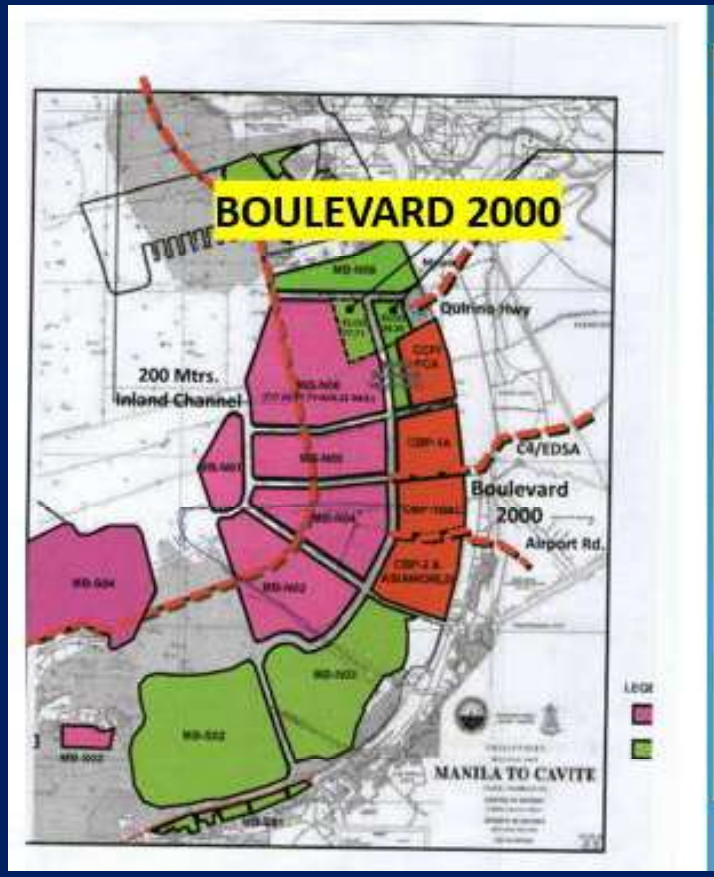
- ECC APPLIED FOR COVERS THE CONSTRUCTION PHASE
- I.E. CREATION OF THE RECLAIMED LAND.

LAND

- Land Use and Classification

  - CONSISTENT WITH CLUP
  - CONSISTENT WITH the Boulevard 2000 Plan
  - NOT IN CONFLICT WITH NIPAS
  - NOT IN CONFLICT W PPROCLAMATION 41

LAND


BOULEVARD 2000
Quirino Hwy
200 Mtrs.
Inland Channel
C4/EDSA
Boulevard
2000
Airport Rd.
MANILA TO CAVITE


PRES PROCLAMATION 41

POSSIBLE SOIL CONTAMINATIONS

During the **Construction Phase**

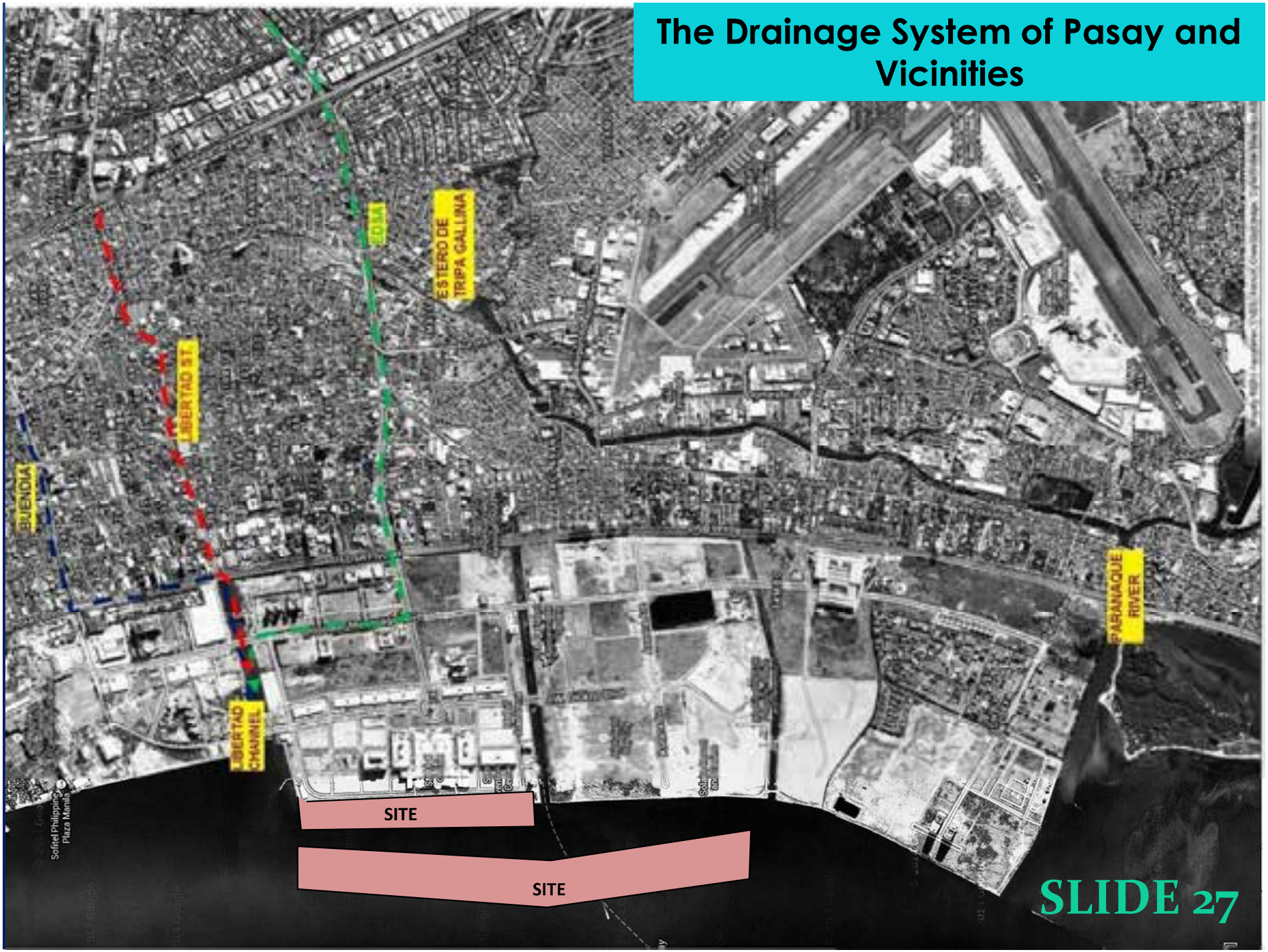
Fill materials from within Manila Bay
Containment walls and/or silt curtains
Reclamation undertaken in phases; impacts will be confined to small areas

During the **Operations Phase**

Reclaimed land already stabilized and consolidated.

WATER

The Drainage System of Pasay and Vicinities

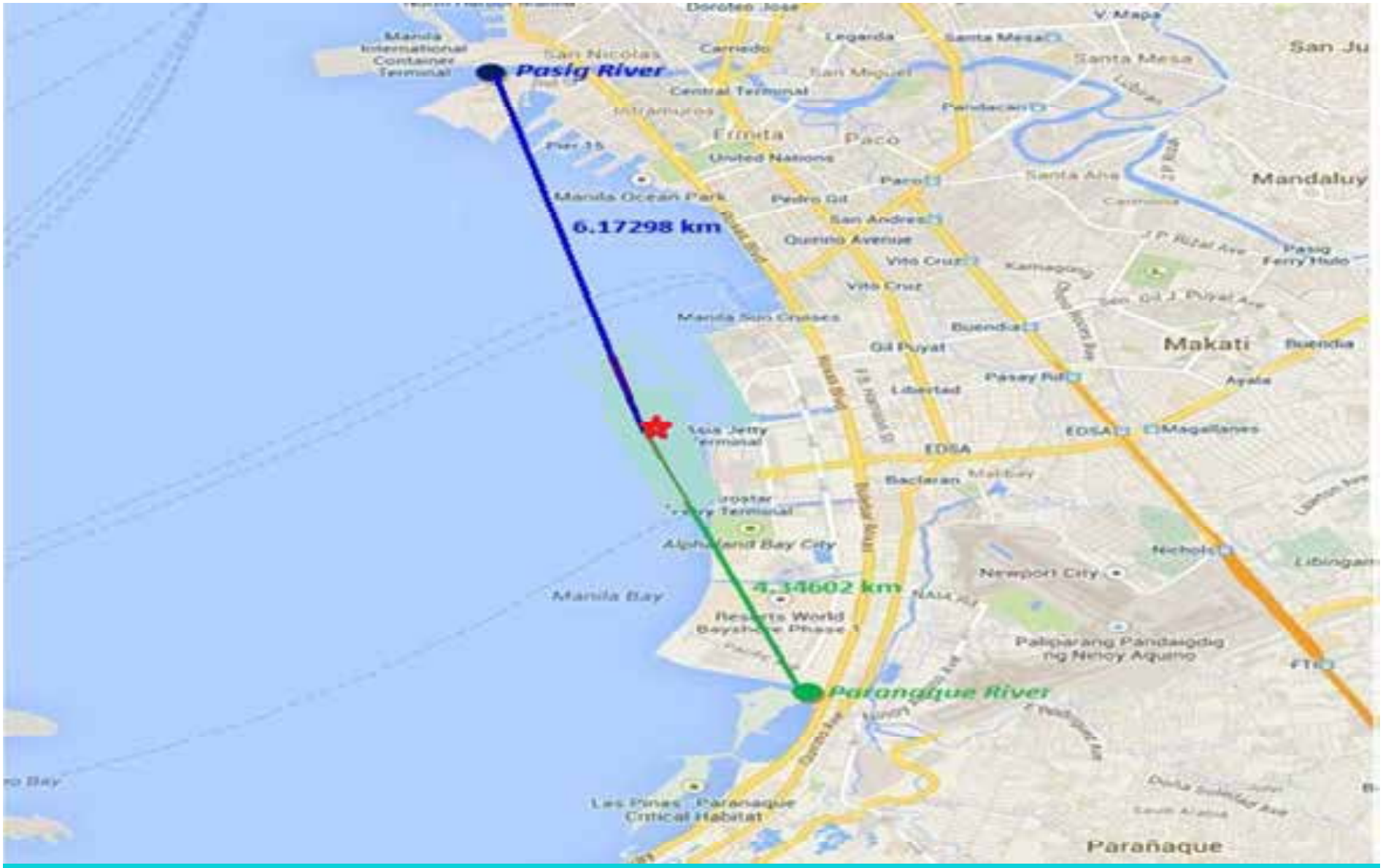


SLIDE 27

EFFECT ON STREAM FLOWS

NO IMPACTS

- DISTANT FROM PASIG AND PARANAQUE RIVERS
- LIBERTAD AND NEARBY CHANNELS NOT BLOCKED NOR FLOWS IMPEDED.



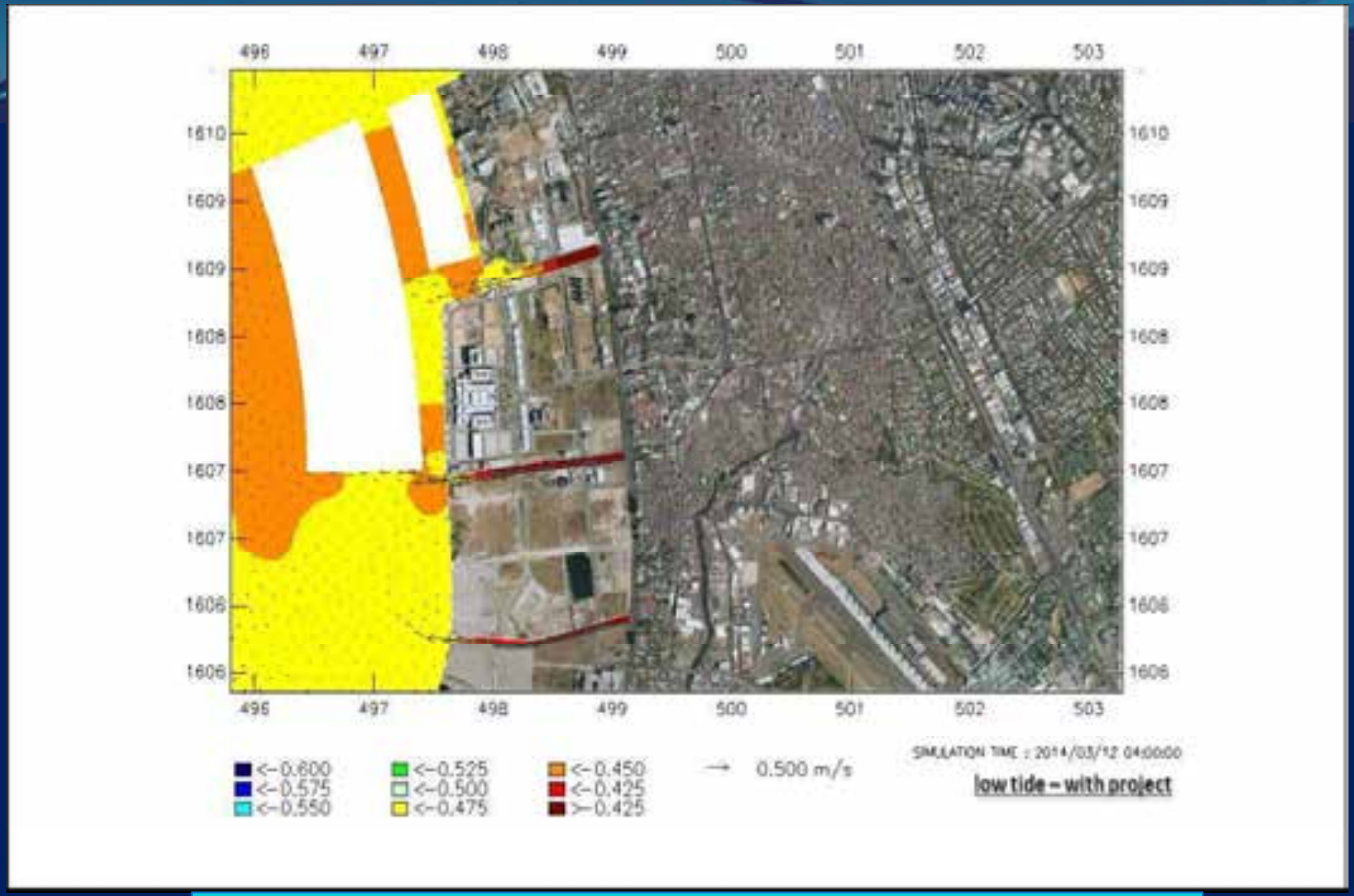
Project Site Relative to Pasig and Paranaque Rivers

OCEANOGRAPHY

Circulation pattern predicted tides, and the surface current systems



Low tide scenario without the proposed project



Low tide scenario with the proposed project

Circulation pattern predicted tides, and the surface current systems

FOR DETAILED DESIGN & ENGINEERING BY AN INTERNATIONALLY-RESPECTED CONSULTING GROUP USING MODERN MODELLING TECHNIQUES

WATER QUALITY

- Degradation of Groundwater quality

  Will not use ground water

- Degradation of Surface water quality

  NO DISCHARGES TO SURFACE WATERS

FRESHWATER ECOLOGY

No significant freshwater systems within the impact areas

MARINE ECOLOGY

- Baseline Parameters
  - **coral reefs**,
  - **seagrass**, and
  - **reef-associated fish communities**

- **Mangroves absent** in project site

- No coral reefs in the area and fisheries resources insignificant

Legend
Manila Bay
Reclamation Extension
Reclamation Project
Roxas Blvd
Manila
Diosdado Macapagal Blvd
Parañaque
NAIA
Airport
Pasay City

MARINE ECOLOGY

- **No significant benthic community of corals, seagrass communities, natural or man-made fish shelters or artificial reef**s, No macro-invertebrates and macro-algae in all the stations surveyed.

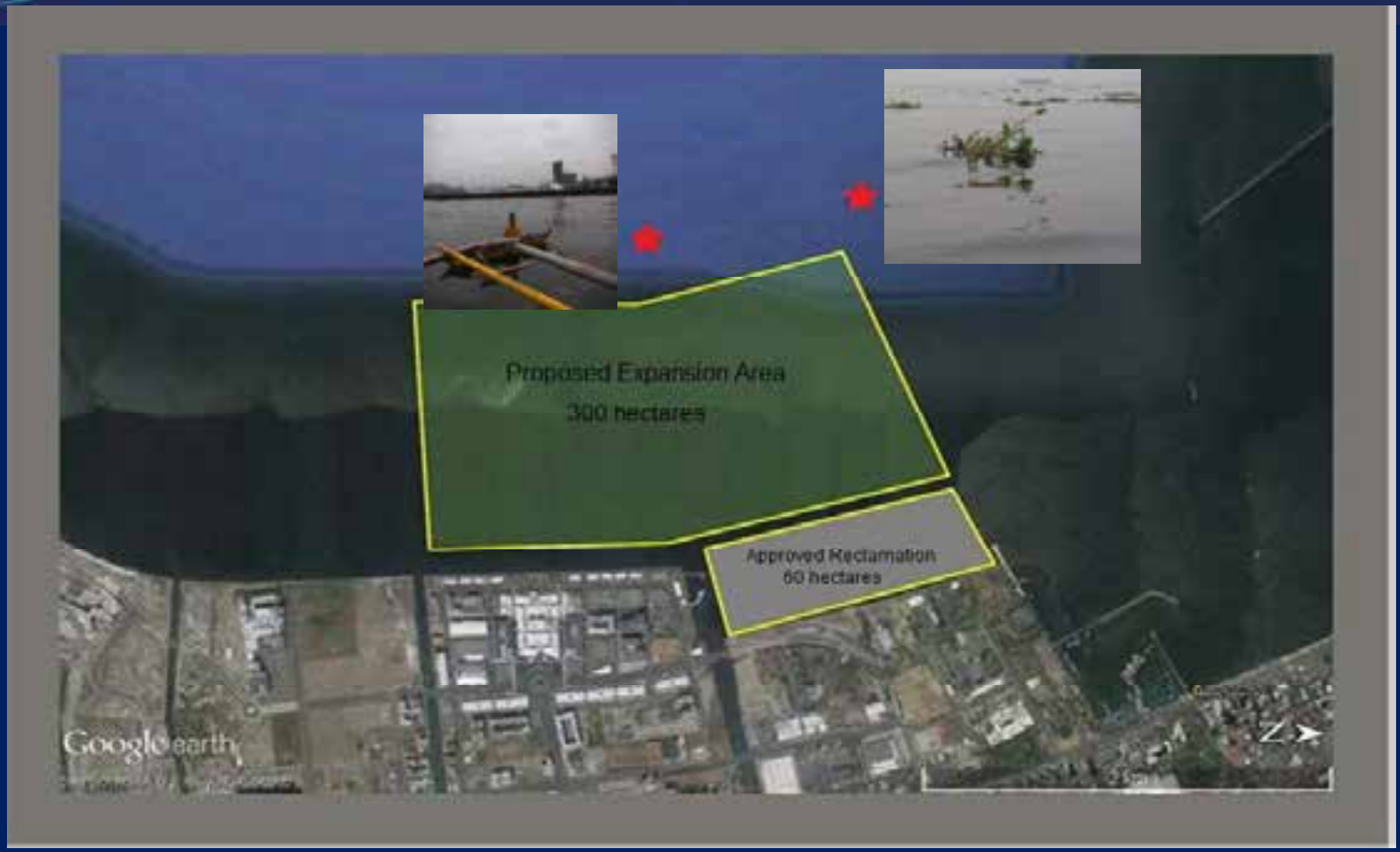
- **Silt and muddy contaminated substrate were observed.** Except for epibenthic species that are resilient to pollution unfavorable to marine species

- **Visibility in the water column acutely turbid.**

- **Seabed is essentially barren and ecological functions are completely unremarkable**

- **No mariculture structures**

Fishing Points



MARINE ECOLOGY

Potential Impacts during Navigation to/from site to San Nicholas Shoal in Cavite



Oyster stakes in Bacoor Bay



Lift nets ("Sapra") and mussel stakes in outer Bacoor Bay

MITIGATING MEASURES

Dredging contractor to be judiciously selected which will include **experience, dredging methodology, equipment to be used** for mitigation of potential impacts on the Manila Bay.

Experiences with previous reclamation works in Manila Bay key

MITIGATING MEASURES TO BE OBSERVED

Preventing discharges of oil leaks from the dredging vessels; in case of accidental leak immediate containment, recovery and disposal of the same.

Dredging vessels wastes discharged to facilities on shore, i.e. not to the Manila Bay.

MATRIX TABLE OF RECLAMATION ACTIVITIES IN RELATION TO IMPACTS

Major Activities	Sub Activities with Potential Impacts on Air and Climate Change	Remarks
Reclamation Loss of small portion of Manila Bay water (0.082% of surface area)		Effect on temperature rise of small water body loss deemed minimal
Dredging (To remove undesirable sea bed materials)	Operation of dredging equipment, use of electric power, e.g. by generating sets	Short term only. Fuel used in generating sets and heavy equipment will generate CO2 and criteria pollutants.

MATRIX TABLE OF RECLAMATION ACTIVITIES IN RELATION TO IMPACTS

Major Activities	Sub Activities with Potential Impacts on Air and Climate Change	Remarks
Reclamation Proper		
Sea travel of dredging vessel from site to San Nicholas Shoal	Use of fuel (diesel oil) to propel vessel and dredgers/cutters will generate combustion products	Pollution source is mobile in nature and is short term, i.e. only during the transport of vessel and operation of dredging equipment
Filling (Materials to be imported)	Same as above	Same as above

MATRIX TABLE OF RECLAMATION ACTIVITIES IN RELATION TO IMPACTS

Major Activities	Sub Activities with Potential Impacts on Air and Climate Change	Remarks
Reclamation Proper		
Installation of sub structures, e.g. containment sheets or curtains	Same as above	
Leveling of reclaimed area to desired grades	Use of compaction and other equipment, potential use of generating sets, Temporary concrete mix batching plan.	Potential fugitive dust generation.

MATRIX TABLE OF RECLAMATION ACTIVITIES IN RELATION TO IMPACTS

Major Activities	Sub Activities with Potential Impacts on Air and Climate Change	Remarks
Reclamation Proper		
Construction of support facilities, roadways, drainage system, etc.	Use of miscellaneous construction equipment, potential use of generating sets Temporary concrete mix batching Plant may be opted.	Same as above
Soil Stabilization	Minimum use of equipment	Essentially no air pollution discharges

PEOPLE

IN–MIGRATION / PROLIFERATION OF INFORMAL SETTLERS

- No informal settlers at the project site.
- Construction crew may be based at the barges and some will be returning to their places of residence after the construction hours
- No In-migration during construction phase

IMPACT ON THE COMMERCIAL ESTABLISHMENT ALONG ROXAS BLVD WITHIN THE BARANGAY DIRECTLY ADJACENT TO THE PROJECT SITE

More competition but more markets

TRAFFIC CONGESTION

On-going and Planned Infrastructures for Traffic Decongestion

Additional expressway project is being constructed.

TRAFFIC CONGESTION

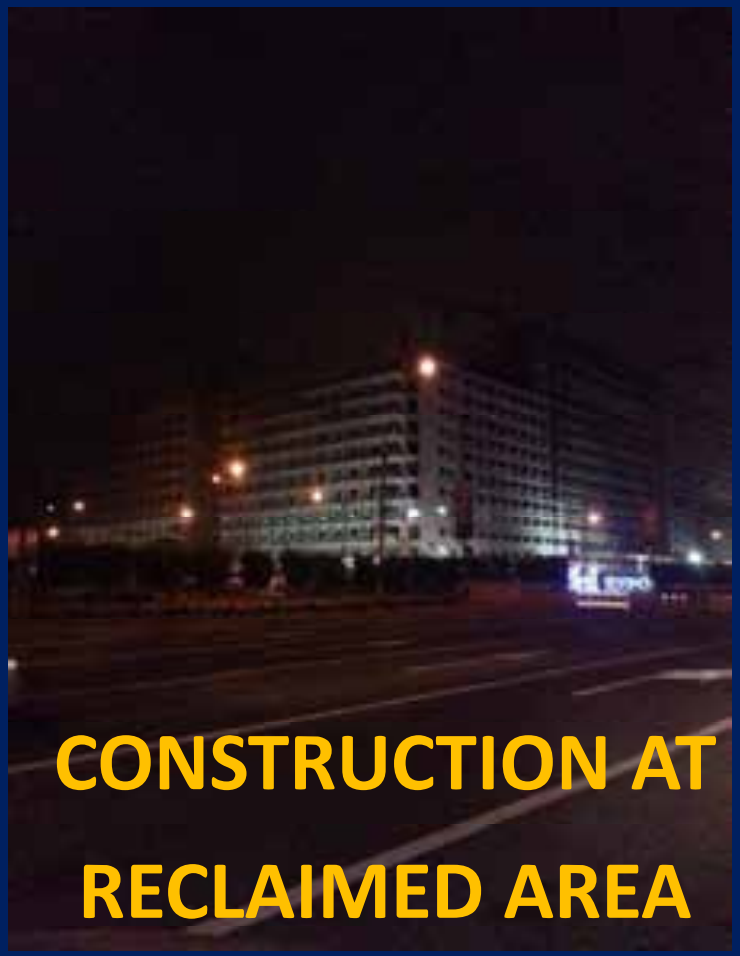
- On-going and Planned Infrastructures for Traffic Decongestion





RISKS AND HAZARDS -LIQUEFACTION





MMEIRS VULNERABLE AREAS

- Spring Country Subdivision,
- Filinvest 2, Filinvest 1,
- Batasan Hills,
- Alabang Heights,
- Barangay Tumana,
- Barangay Pansol,
- La Vista,
- Loyola Grand Villas,
- Loyola Heights,
- Miriam College,
- Ateneo,
- Barangay Barangka,
- Barangay Industrial Valley Complex,
- Blueridge A,
- Eastwood Mall,
- White Plains,
- Green Meadows,
- St. Ignatius,
- Acropolis,
- Medical City,
- Valle Verde Villages,
- Tiendesitas,
- University of Life Pasig,
- St. Paul Pasig,
- Barangay Kapitolyo,
- Department of Education,
- URC Plant,
- Barangay Oranbo,

MMEIRS VULNERABLE AREAS

- Barangay Bagong Ilog,
- East Rembo,
- Bgy. Comembo,
- International School,
- Market Market Mall,
- Serrendra,
- Bgy. Pembo,
- Bgy. Rizal,
- Mckinley Heights,
- Cypress Towers,
- North Signal Village,
- Tribeca Private Residences,
- Buli, Asya Enclaves,
- Alabang Hills,
- Muntinlupa City Proper,
- Tunasan,
- Susana Heights,
- Southwoods,
- De La Salle Canlubang and
- Stone Crest

LIQUEFACTION

- 1961 ALASKA AND NIIGATA EARTHQUAKES SIGNIFICANT LIQUEFACTION DAMAGES
- THOROUGH ENGINEERING STUDIES BY PROF HARRY SEED OF UNIVERSITY OF CALIFORNIA BERKELY
- BASIS FOR ENGINEERING DESIGN

By : Prof. S. Reyes

ENGINEERING INTERVENTIONS



The technical viability of foreshore reclamation is hardly a controversial issue because the critical aspects in the present state of the art can be adequately and reliably addressed. Moreover, reclamation is not new.

In Tokyo Bay where the subsoil is similar to that of Manila Bay and seismicity is even greater, reclamation has been ongoing since the Meiji period. Japan of course is also visited by strong typhoons. To date, it has been reported that the reclaimed areas in Tokyo Bay total more than 25,000 hectares.

Ret. U.P. Professor & Consultant Salvador Reyes
Geotechnical Engineer PhD Univ Illinois BS CE Univ of the Phil

ENGINEERING INTERVENTIONS





VERTICAL CONSTRUCTIONS NEAR SITE AUGUST 2016

ENGINEERING INTERVENTIONS



NEAR WVF OUTSIDE PASAY

AUGUST 2016

GROUND SUBSIDENCE

- WELL DOCUMENTED IN METRO MANILA
- CAUSE IS EXCESSIVE GROUND WATER EXTRACTION
- NO WATER EXTRACTION IN PROJECT

FLOODING



CLOGGED ESTEROS

SLIDE 60

FLOODING

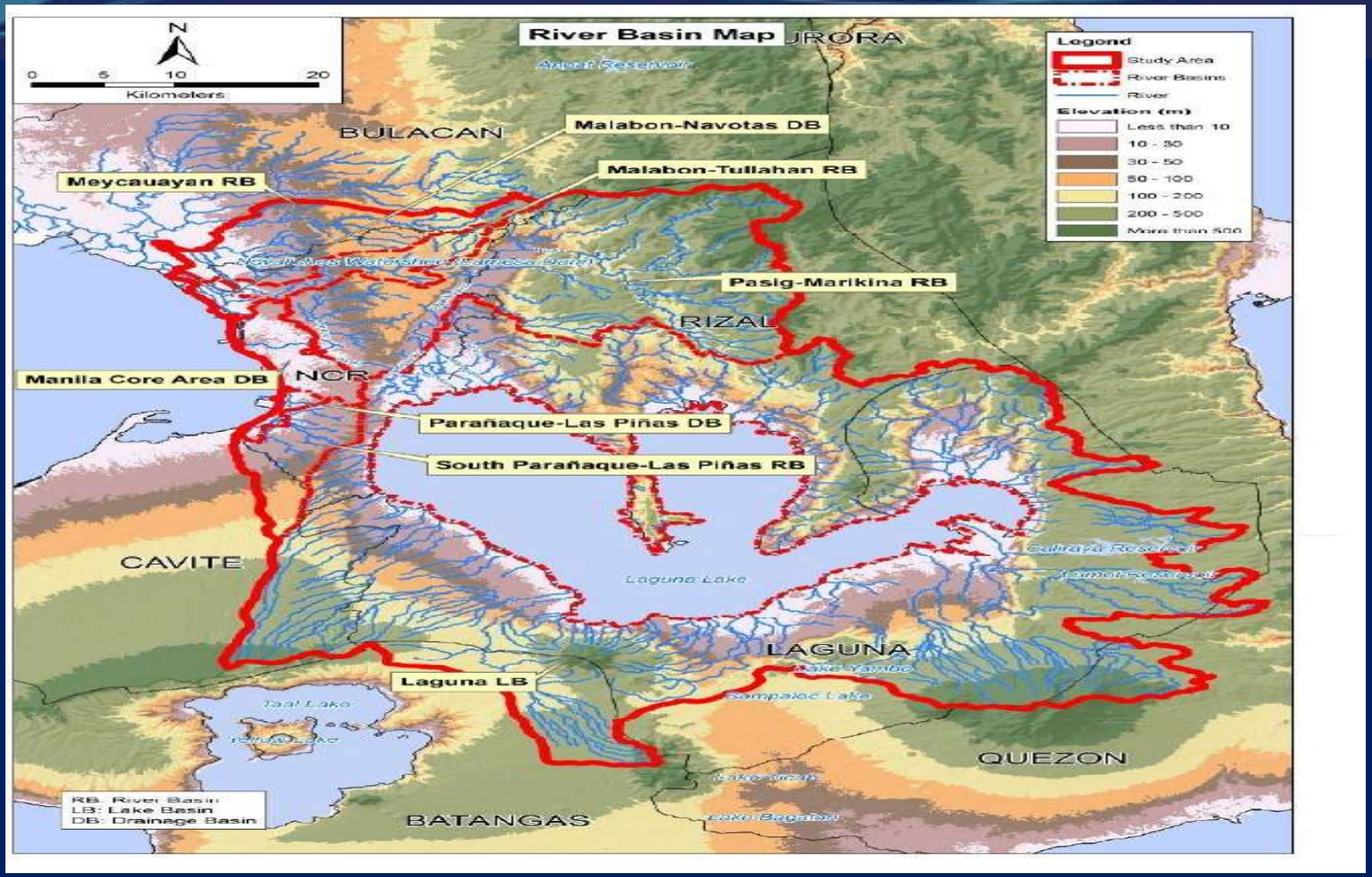
'Reclamation solution to Metro flooding'

The Philippine Star Updated October 04, 2012

MANILA, Philippines - Land reclamation is the solution to flooding in Metro Manila, Cebu and other urban areas in the country, known architect Felino Palafox Jr. said yesterday.

Palafox said that reclamation….. can "do the country a lot of good if done properly."

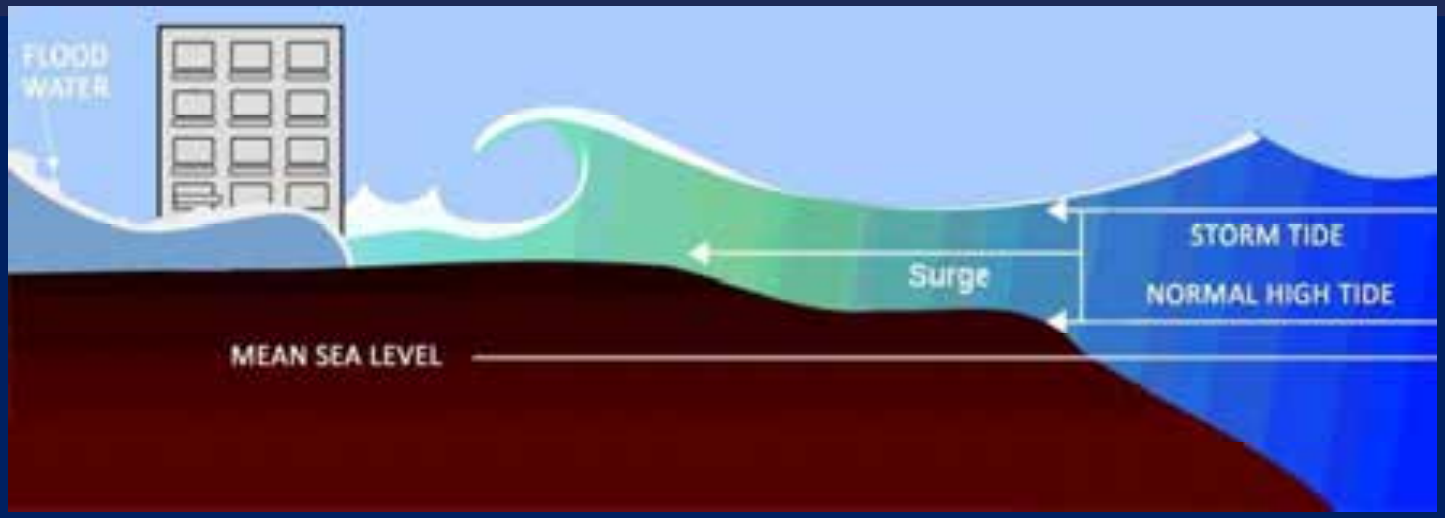
WB MASTER PLAN



FLOOD CONTROL PROJECTS

- INCLUDES PURCHASE OF NEW HEAVY DUTY PUMPS

STORM SURGES



NO RECLAMATION



WITH RECLAMATION

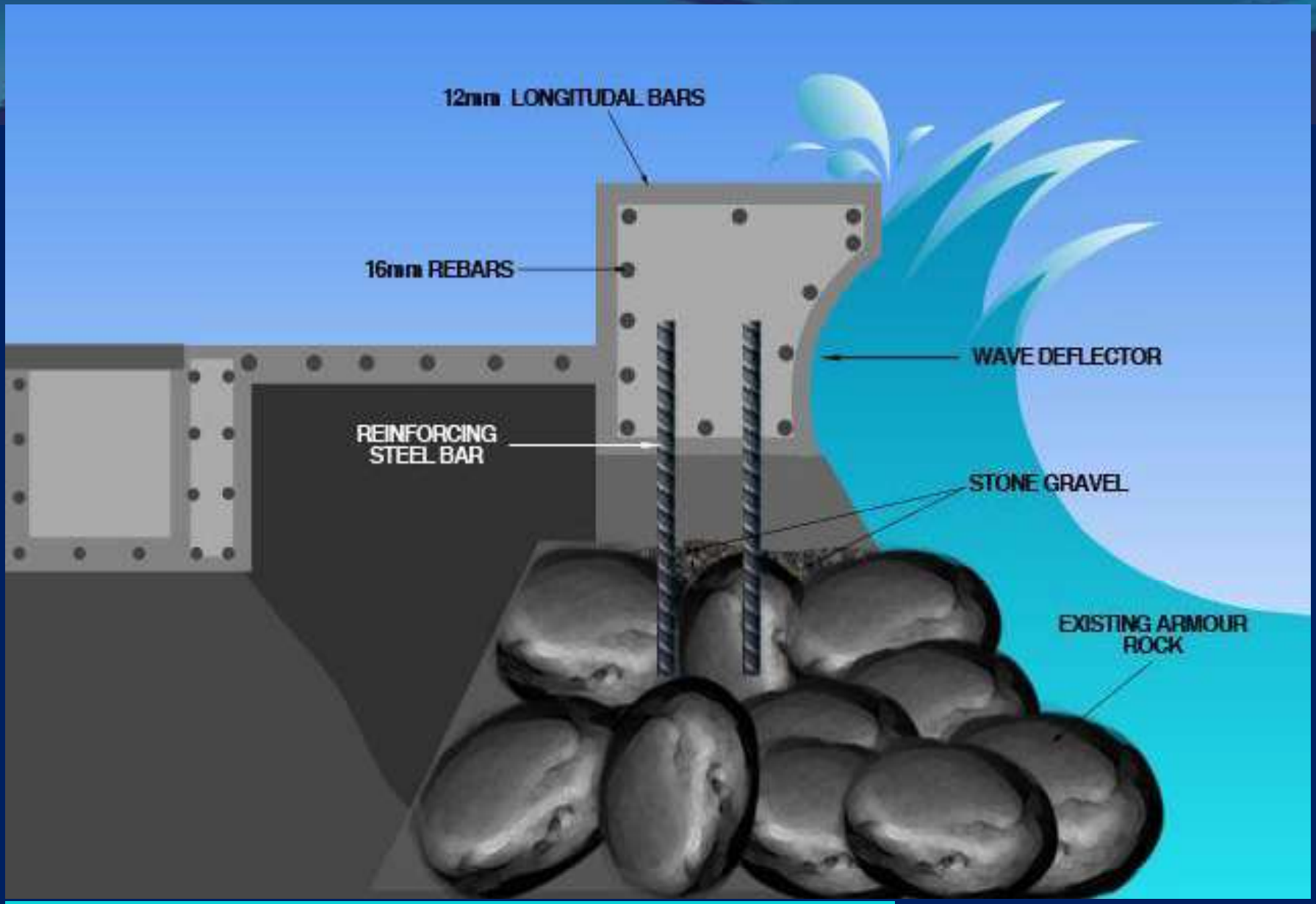


Illustration of a Wave Deflector Showing the Waves Bouncing Back to the Sea

TYPHOON GLENDA



Sand Bags in Manila Bay During the Height of Typhoon Glenda

ROXAS BLVD 9/11



Accelerated Sea Level Rise



Dissipation in Manila Bay and China Sea
WATER BODY DISPLACED REPLACED BY CREATION AT THE SHOAL SITE

SUCCESS STORIES



SUCCESS STORIES

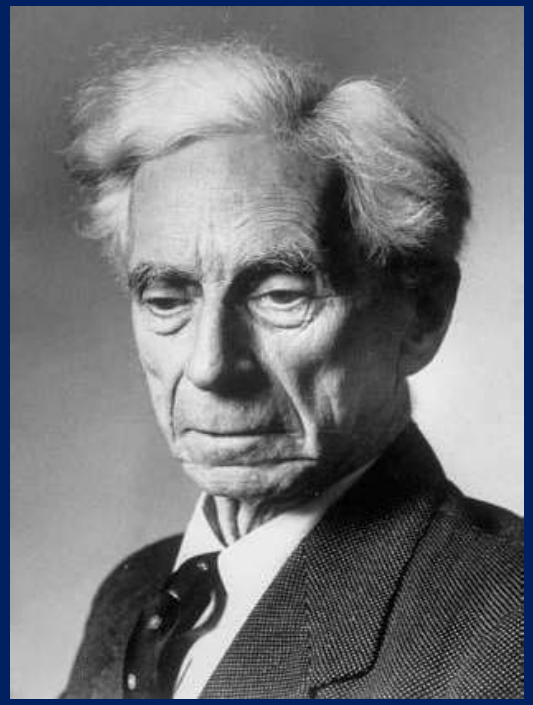
2015 APEC CONFERENCE OF WORLD LEADERS IN A RECLAIMED LAND CONFERENCE IN A RECLAIMED LAND



SUCCESS STORIES

TO CONQUER FEAR IS THE BEGINNING OF WISDOM

- **BERTRAND RUSSEL**
- **BRITISH LOGICIAN**



SUCCESS STORIES-CEBU



SUCCESS STORIES-OTHERS



SUCCESS STORIES-OTHERS

- **Singapore**. The economic growth of Singapore in the recent years is largely attributed to its reclamation project. Singapore expanded its land area by 25% through reclamation without any negative impacts.

- **25% of Hong Kong Island**

SUCCESS STORIES-OTHERS

- Large parts of the Netherlands are reclaimed land of about 7,000 square kilometers. The building of dikes on the reclaimed area saved the country from floods from the sea.

- Large Parts of Rio de Janeiro, most notably several blocks in the new docks area, the entire Flamengo Park and the neighborhood of Urca

- Parts of Dublin, Ireland

- Saint Petersburg, Russia

SUCCESS STORIES-OTHERS

- Dublin, Ireland
- New Orleans (which is partially built on land that was Montevideo, Uruguay, Rambla Sur and several projects Panama City urban and street development are based on Panama Canal excavations.
- Helsinki (of which the major part of the city center Foreshore in Cape Town, South Africa
- Chicago shoreline
- Hassan II Mosque in Morocco
- Barcelona, in Spain
- Back Bay, Boston, Massachusetts
- Battery Park City, Manhattan
- Liberty State Park, Jersey City

SUCCESS STORIES-OTHERS

- Zeebrugge in Belgium
- Brest, Belarus
- Toronto Islands,
- Leslie Street Spit, waterfront in Toronto
- Nun's Island, Ile Notre-Dame in Montreal
- Fontvieille, Monaco
- Port Hercules in La Condamine, Monaco
- The Fens in Eastern England
- Haikou Bay, Hainan Province, China , where the west Haidian Island Haikou City, where new land for a Macau, The Cotai Strip, where most of the major casinos Nagoya Centrair Airport, Japan
- Incheon International Airport Korea
- Beirut Central District, Lebanon
- Major parts of the city of Mumbai, India

FOR MORE INFORMATION, CONTACT:

- **TECHNOTRIX CONSULTANCY SERVICES, INC.**
  New Manila, Quezon City
  Telefax: (02) 416 4625; Mobile: 0917 825 5203
  Email: technotrixinc@gmail.com

- **THE CITY OF PASAY**
  ATTY. SEVERO C. MADRONA
  LEGAL OFFICER
  TEL. (02) 833 3729

ANNEX C

ANNEX 3 Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City		
Organization	**Issues and Concerns Raised**	**Proponent's Response**
Ms. Lou Arsenia Archdiocese Of Manila	1. Sourcing of filling material from San Nicolas Shoal is legally questionable.	The San Nicholas Shoal Dredging Project is presently applying for an ECC; this will resolve question of legality. Other sources of filing materials are available and will be explored.
	2. According to BFAR there are significant existing fishes and that these can further increase.	Key points are (a) significant fishes (b) survey points in Manila Bay. Slides 36-38 respond to these; Slide 37 shows survey area within the impact zone.Slide 39 shows Aug 20, 2016 fishing survey at the impact zone. (Note: Significant Fishing done outside the project site) Mayor's Speech… "Will neither negatively impact on fisherfolks or damage marine life… Will put up fisherman's whart"
	3. DPWH letter denying grant of MGDC LONO	In Mayor's Opening Remarks he cited that in fact DPWH actually issued a LONO. ***Post PubHearing Response:*** The project on hand is the Pasay Reclamation which is not related to the MGDC Reclamation Project. (**See Note 3)**
	4. Other countries may have reclamation but they have been spending money for maintenance.	***Post PubHearing Response:*** Maintenance will be regular part of the EMP and will be funded by the Project Developer.
	5. Flooding, liquefaction, traffic etc., are not perception, these are realities	Project has not been implemented yet, "perception" used as a term to connote "impact" which is a basic aspect of an EIS. ***Post PubHearing Note:*** "Realities"cannot be attached to an acitivty/Project

ANNEX 3 Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City		
Organization	**Issues and Concerns Raised**	**Proponent's Response**
		that is not existing.
	6. Continuing Mandamus on Manila Bay	Not applicable for a project which is not yet implemented. No mandamus or compelling action at this stage of the Project. **(See Note 6)**
	7. Precautionary Principle	Briefly explained during the PH **(See Note 7)**
	8. Tourism--- People can go to environmental friendly areas not commercial areas as envisioned.	Mayor cited tourism related project aspects: public parks, recreation centers..etc.
Atty. Galad Pe Benito Consultant of Arch. Of Manila	9. The Project is the City of Pasay **only**. The EMB required the proponent for a single EIS. The project is piecemeal approach. Why not programmatic EIS, the impacts will be different compared to piecemeal approach.:	**Engr. Espie Sajul:** Yes, Single EIS Only, although options for Programmatic EIS are available. The proposed project applied for is only for reclamation. **EIA Consultant :** In the EIS only one proponent will stand and apply for the proposed project. The proponent is accountable and responsible. **Prof Gerry:** We the REVCOM, know what project EIS classification should be recommended. The existing laws in the EIS is *"bulok"* (rotten). What can we do is follow the existing law although *"may kakulangan ang dating batas."* Hence there are IRR guidelines. (The EIA Consultant explained that they are complying strictly with the Revised Procedural Manual and showed to the Public a copy of this)
	10. The proposed project in the EIS is mixed use but the project is for reclamation.	Slide 22. Clearly states project covers only creation of reclaimed land. Slides 6-7 shows major components, Slide 8 support facilities and Slide 9 Prelim Master Plan
Mr. Garcia Sy	11. Traffic congestion; the Project will not solve traffic	Clarified as follows : EIS calls for impacts and

ANNEX 3 Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City		
Organization	**Issues and Concerns Raised**	**Proponent's Response**
Associated with Save our Shore Movement	congestion.	mitigation; traffic is an impact of the project for which mitigation measures are identified. The Project was never intended to be a solution to the traffic problem in Manila. Slides 50 and 51.
	12. The proponent can provide jobs in other area in the Philippines. The stated number of employees to be hired will contribute to traffic congestion.	Reclamation project may bring problem to traffic congestion but there are mitigation measures. It may also be noted that if the 2,100,000 Employees would be located on shore, i.e. in a no reclamation project scenario, traffic congestion may even be worse. **Post PH response:** Proponent is not allowed to undertake projects in other areas in the Phl.
Ms. Lou Arsenia Archdiocese Of Manila	13. Fishermen who fishes along Manila Bay up to Paranaque are said to be prohibited to fish because of reclamation. *"Tinataboy ang mga mangingisda na mangisda dahil sa reclamation"*	Noted. (This refers to another project not the Pasay Reclamation Project).
Ms. Arlene Tengonciang **Save our shores (Geologist)**	14. Risks on • Land Subsidence • Flooding--- Reclamation will result to provide water into the bay to come up into the shore • Storm Surge	Responded already in the Presentation of EIA Consultant Further explanation in **Note 14.** Mayor noted that Pres Obama and other Head of States stayed at the existing Reclaimed Area facilities. Slide 70 is photo of APEC leaders in Reclamation area.
	15. Issues on Ruby Tower	Main cause of Tower collapse was faulty design and construction.

ANNEX 3 Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City		
Organization	**Issues and Concerns Raised**	**Proponent's Response**
		No clear cut evidence of liquefaction; this phenomenon was studied in details after the Alaska and Niigata 1961 experience (few years before the Ruby Tower) disaster Slide 55. Further explanation in **Note 15.**
	16. Maybe there are other solutions beside reclamation that can improve the water quality of Manila Bay to increase fishes.	Noted. The PEISS requires impacts and mitigation for a particular project. ***Post PubHearing Note:*** (The project on hand is reclamation and thus impacts and mitigations should refer to this particular and not to other types of project. Water quality impact is a result of the project NOT the objective)
Archdiocese of Manila	17. Who will spend the proposed project? Clarification raised on who the partner of the City is.	This is a project of the City Government of Pasay . No joint venture agreement with Ayala. **Post PubHearing Note:** The City will not spend for the Project
Ms. Lou Arsenia Archdiocese Of Manila	18. The church built within the reclamation area is currently experiencing problems and needs rehabilitation because water from the sea is reaching the area.	Noted. Post PubHearing Note.. When the Project materializes; the City of Pasay will include in their SDPs assistances to the church.
Mrs. Hailey Saturnino Representative of Parish Church and Resident of Pasay	19. Continuing Mandamus on Manila Bay 20. Presidential Proclamation No 41 of President Magsaysay	Refer to **Item 6**. The areas covered by this Proclamation do not conflict with the Project as shown in the Presentation. Slide 24.

ANNEX 3 Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City		
Organization	**Issues and Concerns Raised**	**Proponent's Response**
	21. NIPAS Act	Post PH.. Project not within the NIPAS; explained in the EIS Report. See **Note 21.**
	22. Flooding in Pasay	Discussed in Slides 27,28,29,60,61,62,63 See **Note 22.**
Mr. Narod Eco- Save our Shores	23. The Reclamation Platform will not solve storm surges and instead only divert storm surge flows to other part of the City.	Measures including the platform itself and wave deflectors are intended to mitigate storm surges. The reclamation structure will dissipate the wave energy from the storm surge. With or without a reclamation storm surges may occur Slides 64 – 67..
Ms. Arlene Tengonciang **Save our shores (Geologist)**	24. Land Subsidence Observed in Metro Manila	Acknowledged but subsidence is due to ground water extraction. There will be none associated with the Project. Slide 59. The image of the land subsidence shows this outside of the site. **See Note 24.**
	25. The created land will subside.	Proven dredging technology by experience contractor will be adopted. Land form created will be stabilized prior to vertical construction. Monitoring for subsidence will be made. **See Note 25.**
	26. Storm Surges will Only Divert the surge to other parts of the Bay/Shore	Slides 64-67. ***Post PubHearing Note.*** Reclamation Projects provide sheltering effects from storm storm suges and are better engineering solution than placing sand bags atop sea walls (Slide 66)

ANNEX 3 Proposed 360 Hectares Reclamation Project Issues and Concerns raised during Public Hearing August 23, 2016 (Tuesday) Started 09:00 a.m Cuneta Astrodome, Pasay City		
Organization	**Issues and Concerns Raised**	**Proponent's Response**
		Even if the surge is diverted its wave energy would have been dissipated after striking the reclamation walls.

NOTES TO THE ABOVE

Note 3.

On the Reference to the 21 June 2016 Letter of the DPWH to Atty M Matias, the issues therein cited; i.e. earthquakes, liquefaction, sea level rise, damage to structures and habitats are all discussed during the Public Hearing and in the EIS Report.

Moreover, the Proponent will necessarily seek "No Objection" Letter from the DPWH after the ECC shall have been secured and for the purpose of getting various permits for Project Implementation.

Note 6. Continuing Mandamus on Manila Bay

Below are verbatim excerpts from the Supreme Court Decision on Continuing Mandamus, G.R. Nos. 171947-48. In highlights are Consultant's initial comments appertaining to the Pasay Reclamation Project; these comments are subject to further legal review.

The Continuing Mandamus on Manila Bay

1.0 The Legal Framework

Substantive Portions of the SC Decision which may be relevant to Projects along the Manila Bay are as follows:

Republic of the Philippines
SUPREME COURT
Manila

EN BANC
G.R. Nos. 171947-48

D E C I S I O N

Our Ruling

The Cleaning or Rehabilitation of Manila Bay Can be Compelled by Mandamus

Generally, the writ of mandamus lies to require the execution of a ministerial duty. A ministerial duty is one that "requires neither the exercise of official discretion nor judgment." It connotes an act in which nothing is left to the discretion of the person executing it. It is a "simple, definite duty arising under conditions admitted or proved to exist and imposed by law." Mandamus is available to compel action, when refused, on matters involving discretion, but not to direct the exercise of judgment or discretion one way or the other.

The MMDA is duty-bound to comply with Sec. 41 of the Ecological Solid Waste Management Act (RA 9003) which prescribes the minimum criteria for the establishment of sanitary landfills and Sec. 42 which provides the minimum operating requirements that each site operator shall maintain in the operation of a sanitary landfill. Complementing Sec. 41 are Secs. 36 and 37 of RA 9003, enjoining the MMDA and local government units, among others, after the effectivity of the law on February 15, 2001, from using and operating open dumps for solid waste and disallowing, five years after such effectivity, the use of controlled dumps.

As Applied to this Particular Project.

Projects which are not yet implemented nor operation cannot be covered by a Mandamus because mandamus is to order what to do as in the case of existing and operational projects or activities.

With or without the Mandamus projects still in the planning stage are necessarily covered and cannot escape the requirements under the various Philippine environmental laws.

A plan or planned action is based by the planning team on projections of the future conditions. Although the future conditions could be based on statistical analysis of past data, computer modeling and comparative analysis of similar areas but in advance stages of development, a component of any plan is still based on the gut feel of the planning team. Gut feel because planning teams have different risk valuation and appreciation of the statistical variation or spread of the information, use different computer models or computers, past experience, and insight on the growth and development of similar actions currently

operating. Given the same problem and same set of data, different teams of planners will come up with different plans as their appreciation and projections of the future conditions.

Nobody could predict the future with accuracy. Once plans are implemented, plans have to be reviewed continuously, updated and even abandoned as the difference between the projections and the actual field conditions are noted. ***To be successful, the implementing team and the administrator must have maximum flexibility to modify, update and even abandon the plan to reflect the actual field conditions and even to external factors affecting the plan.*** External factors could be changes in technology, availability of alternative materials and markets, changing market demands and preferences, and even laws governing the implementation of the plan***. The failure of the economies of the Soviet Union and the communist countries could be blamed on their strict adherence to plans even when the actual field conditions differ from those projected when the plans were made. They ended up producing products that the market does not want and would refuse the slightest modification until the next planning period.*** They refused to adapt more efficient technologies even if they themselves have invented it until the next planning period and subsequently loss the opportunity to dominate the market. Titanium is a good example. The soviet union has almost a monopoly of the titanium supply and researches on the uses of titanium but it was the western economies that were able to take advantage of the uses of the titanium.

Let us look at the SC definition of Mandamus it is own judgement as quoted below.

"Generally, the writ of mandamus lies to require the execution of a ministerial duty. A ministerial ***duty is one that "requires neither the exercise of official discretion nor judgment." It connotes an act in which nothing is left to the discretion of the person executing it."***

As highlighted the mandamus is applicable to ministerial duty where it does not require the exercise of official discretion nor judgement. It is an act which nothing is left to the discretion of the person executing it. This is underlined, highlighted in bold and italics.

As plans to be successful requires maximum flexibility, discretion and judgement to modify, update and even abandon it as the official or persons implementing the plans notes the differences of the actual field conditions from those projected during the planning exercise. Plans or actions still in the planning stage or even actions that have not been completed could not be subject to mandamus.

(1) The DENR, under Executive Order No. (EO) 192, is the primary agency responsible for the conservation, management, development, and proper use of the country's environment and natural resources. Sec. 19 of the Philippine Clean Water Act of 2004 (RA 9275), on the other hand, designates the DENR as the primary government agency responsible for its enforcement and implementation, more particularly over all aspects of water quality management. On water pollution, the DENR, under the Act's Sec. 19(k), exercises jurisdiction "over all aspects of water pollution, determine[s] its location, magnitude, extent, severity, causes and effects and other pertinent information on pollution, and [takes] measures, using available methods and technologies, to prevent and abate such pollution."

(2) The DENR, under RA 9275, is also tasked to prepare a National Water Quality Status Report, an Integrated Water Quality Management Framework, and a 10-year Water Quality Management Area

Action Plan which is nationwide in scope covering the Manila Bay and adjoining areas. Sec. 19 of RA 9275 provides:

> Sec. 19 *Lead Agency*.—The [DENR] shall be the primary government agency responsible for the implementation and enforcement of this Act x x x unless otherwise provided herein. As such, it shall have the following functions, powers and responsibilities:
>
> a) Prepare a National Water Quality Status report within twenty-four (24) months from the effectivity of this Act: Provided, That the Department shall thereafter review or revise and publish annually, or as the need arises, said report;
>
> b) Prepare an Integrated Water Quality Management Framework within twelve (12) months following the completion of the status report;
>
> c) Prepare a ten (10) year Water Quality Management Area Action Plan within 12 months following the completion of the framework for each designated water management area. Such action plan shall be reviewed by the water quality management area governing board every five (5) years or as need arises.

The DENR has prepared the status report for the period 2001 to 2005 and is in the process of completing the preparation of the Integrated Water Quality Management Framework. Within twelve (12) months thereafter, it has to submit a final Water Quality Management Area Action Plan Again, like the MMDA, the DENR should be made to accomplish the tasks assigned to it under RA 9275.

(6) The PCG, in accordance with Sec. 5(p) of PD 601, or the Revised Coast Guard Law of 1974, and Sec. 6 of PD 979, or the Marine Pollution Decree of 1976, shall have the primary responsibility of enforcing laws, rules, and regulations governing marine pollution within the territorial waters of the Philippines. It shall

promulgate its own rules and regulations in accordance with the national rules and policies set by the National Pollution Control Commission upon consultation with the latter for the effective implementation and enforcement of PD 979. It shall, under Sec. 4 of the law, apprehend violators who:

> a. discharge, dump x x x harmful substances from or out of any ship, vessel, barge, or any other floating craft, or other man-made structures at sea, by any method, means or manner, into or upon the territorial and inland navigable waters of the Philippines;
>
> b. throw, discharge or deposit, dump, or cause, suffer or procure to be thrown, discharged, or deposited either from or out of any ship, barge, or other floating craft or vessel of any kind, or from the shore, wharf, manufacturing establishment, or mill of any kind, any refuse matter of any kind or description whatever other than that flowing from streets and sewers and passing therefrom in a liquid state into tributary of any navigable water from which the same shall float or be washed into such navigable water; and
>
> c. deposit x x x material of any kind in any place on the bank of any navigable water or on the bank of any tributary of any navigable water, where the same shall be liable to be washed into such navigable water, either by ordinary or high tides, or by storms or floods, or otherwise, whereby navigation shall or may be impeded or obstructed or increase the level of pollution of such water.

a-c not relevant because to projects still in the planning stages.

(7) When RA 6975 or the Department of the Interior and Local Government (DILG) Act of 1990 was signed into law on December 13, 1990, the PNP Maritime Group was tasked to "perform all police functions over the Philippine territorial waters and rivers." Under Sec. 86, RA 6975, the police functions of the PCG shall be taken over by the PNP when the latter acquires the capability to perform such functions. Since the PNP Maritime Group has not yet attained the capability to assume and perform the police functions of PCG

over marine pollution, the PCG and PNP Maritime Group shall coordinate with regard to the enforcement of laws, rules, and regulations governing marine pollution within the territorial waters of the Philippines. This was made clear in Sec. 124, RA 8550 or the Philippine Fisheries Code of 1998, in which both the PCG and PNP Maritime Group were authorized to enforce said law and other fishery laws, rules, and regulations.[25]

(8) In accordance with Sec. 2 of EO 513, the PPA is mandated "to establish, develop, regulate, manage and operate a rationalized national port system in support of trade and national development." Moreover, Sec. 6-c of EO 513 states that the PPA has police authority within the

> ports administered by it as may be necessary to carry out its powers and functions and attain its purposes and objectives, without prejudice to the exercise of the functions of the Bureau of Customs and other law enforcement bodies within the area. Such police authority shall include the following:
> x x x x
>
> b) To regulate the entry to, exit from, and movement within the port, of persons and vehicles, as well as movement within the port of watercraft.

Secs. 17 and 20 of the Environment Code
Include Cleaning in General

The disputed sections are quoted as follows:

> Section 17. *Upgrading of Water Quality*.—Where the quality of water has deteriorated to a degree where its state will adversely affect its best usage, the government agencies concerned shall take such measures as may be necessary to upgrade the quality of such water to meet the prescribed water quality standards.

Section 20. *Clean-up Operations*.—It shall be the responsibility of the polluter to contain, remove and clean-up water pollution incidents at his own expense. In case of his failure to do so, the government agencies concerned shall undertake containment, removal and clean-up operations and expenses incurred in said operations shall be charged against the persons and/or entities responsible for such pollution.

Not spplicable to Projects which have been implemented yet; and therefore there is no pollution.

The cleanup and/or restoration of the Manila Bay is only an aspect and the initial stage of the long-term solution. The preservation of the water quality of the bay after the rehabilitation process is as important as the cleaning phase. It is imperative then that the wastes and contaminants found in the rivers, inland bays, and other bodies of water be stopped from reaching the Manila Bay. Otherwise, any cleanup effort would just be a futile, cosmetic exercise, for, in no time at all, the Manila Bay water quality would again deteriorate below the ideal minimum standards set by PD 1152, RA 9275, and other relevant laws. It thus behooves the Court to put the heads of the petitioner-department-agencies and the bureaus and offices under them on continuing notice about, and to enjoin them to perform, their mandates and duties towards cleaning up the Manila Bay and preserving the quality of its water to the ideal level. Under what other judicial discipline describes as "continuing mandamus," the Court may, under extraordinary circumstances, issue directives with the end in view of ensuring that its decision would not be set to naught by administrative inaction or indifference. In India, the doctrine of continuing mandamus was used to enforce directives of the court to clean up the length of the Ganges River from industrial and municipal pollution.

Judicial notice may likewise be taken of factories and other industrial establishments standing along or near the banks of the Pasig River, other major rivers, and connecting waterways. But while they may not be treated as unauthorized constructions, some of these establishments undoubtedly contribute to the pollution

of the Pasig River and waterways. The DILG and the concerned LGUs, have, accordingly, the duty to see to it that non-complying industrial establishments set up, within a reasonable period, the necessary waste water treatment facilities and infrastructure to prevent their industrial discharge, including their sewage waters, from flowing into the Pasig River, other major rivers, and connecting waterways. After such period, non-complying establishments shall be shut down or asked to transfer their operations.

Not applicable, Project has not been implemented.

The importance of the Manila Bay as a sea resource, playground, and as a historical landmark cannot be over-emphasized. It is not yet too late in the day to restore theManila Bay to its former splendor and bring back the plants and sea life that once thrived in its blue waters. But the tasks ahead, daunting as they may be, could only be accomplished if those mandated, with the help and cooperation of all civic-minded individuals, would put their minds to these tasks and take responsibility. This means that the State, through petitioners, has to take the lead in the preservation and protection of the Manila Bay.

RA 9003 is a sweeping piece of legislation enacted to radically transform and improve waste management. It implements Sec. 16, Art. II of the 1987 Constitution, which explicitly provides that the State shall protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature.

> WHEREFORE, judgment is hereby rendered ordering the abovenamed defendant-government agencies to clean up, rehabilitate, and preserve Manila Bay, and restore and maintain its waters to SB level (Class B sea waters per Water Classification Tables under DENR Administrative Order No. 34 [1990]) to make them fit for swimming, skin-diving, and other forms of contact recreation.

Note 7. On Precautionary Principle

The Supreme Court "Rules of Procedure for Environmental Cases" (**A.M. No. 09-6-8-SC) stipulates :**

RULE 20

PRECAUTIONARY PRINCIPLE

SECTION 1. *Applicability.*—When there is a lack of full scientific certainty in establishing a causal link between human activity and environmental effect, the court shall apply the precautionary principle in resolving the case before it.

The constitutional right of the people to a balanced and healthful ecology shall be given the benefit of the doubt.

SEC. 2. *Standards for application.*—In applying the precautionary principle, the following factors, among others, may be considered: (1) threats to human life or health; (2) inequity to present or future generations; or (3) prejudice to the environment without legal consideration of the environmental rights of those affected.

Precautionary Principle which is vaguely defined in the above is explained in the Rio Declaration and elaborated as follows:

The Rio Declaration definition of the precautionary principle was crafted and agreed by all the member countries of the United Nations including the Philippines to facilitate the development of international

agreements on sustainable development such as the United Nations Framework Convention on Climate Change.

On the domestic level, the Rio Declaration aims to harmonize the interaction of conflicting priorities, needs and political orientations of various sectors. The precautionary principle formulated in the Rio Declaration, broadly defined the "standing requirements" for petitioners and the "compliance requirements" of the defendants in environmental cases, i.e. for the parties to show proof on the absence or the presence of "cost effective measures to protect the environment". This means that the petitioner will have to prove that the defendant has no plans if the action or project is still in the planning stage or implement if the action or project is ongoing of cost effective measures to protect the environment.

The term "cost effective measures to protect the environment" is an important ground for resolving and deciding if the parties in a conflict has complied with their duty of care of the environment.

The precautionary principle further acknowledges that it is to be applied in "accordance with the capabilities" of the country. This term is critical to sustainable development inasmuch as peace, environmental protection and development are interdependent and indivisible. Developmental status of each country in terms of financial, technical and human resources are different. For sustainable development to be feasible, the three pillars of peace, environmental protection and development must be balance or treated equally. This means the petitioner in an environmental case should not just pick cost effective measures in highly developed countries nor the defendant be allowed to cite cost effective measures taken from the developing countries. Both parties has to consider the specific economic, environmental, social, technological, and financial factors of the Philippines in their petitions and defense.

Note 14. Risks on

- **Land Subsidence**
- **Flooding--- Reclamation will result to provide water into the bay to come up into the shore**

- **Storm Surge**

Ground subsidence at excessive and accelerating rates is cited as pertinent on the basis of satellite generated measurements during the period from 2003 to 2006. In geotechnology, ground subsidence or settlement reduction in volume or consolidation is conveniently thought of as having primary and secondary components where, with the exception of highly organic soils, the primary component predominates. It is caused by the gradual removal of pore water due to superposed loads or by the reduction of pore pressure itself due typically to excessive groundwater extraction.

The secondary or creep takes place at a much slower pace. But more or less, primary and secondary consolidation plot as straight lines on a logarithmic time scale; i.e., at decreasing (not accelerating nor even constant) time rates. In this respect the results of the satellite measurements over a short period of time is of limited use except to indicate, expectedly, that on-going ground subsidence is relatively greater in the southern portion near the lake of Greater Metro Manila but not in areas of Quezon City, Ortigas Center, and Fort Bonifacio where numerous high rise buildings had been built by 2003 simply because the foundations of these buildings transmit loads to the relatively incompressible bedrock. More importantly, the observed subsidence pattern shows that ground water extraction to the south of Metro manila does not cause ground subsidence away from the area, as seen from the satellite data.

In areas of Manila where the thickness of the soft soil may be anywhere from less than ten to thirty or more meters, subsidence is much less because it is mainly due to secondary consolidation. Most importantly, the technology exists from reliably estimating and taking into account ground subsidence in the area proposed to be reclaimed.

Dr Kelvin Rodolfo (and others)

"The land (Metro Manila) is subsiding about 30 times faster, mainly from over-pumping of ground water.The added weight of new buildings in reclaimed areas may also speed up the sinking of the land, as is occurring in Shanghai.

The proposed reclamation areas experiencing up to 5 centimeters or about 2 inches per year (Source Dr Mahar Lagmay)

This concern or perception has also been cited in the Video Message of Cardinal Tagle and the Church's open letter in 2013 to President Aquino.

The reference to the experience in Shanghai is incomplete and misleading. What is not explained is that the soil of Shanghai is generally soft and that land subsidence is largely attributed to ground water extraction.

The project will not draw ground water and will in fact draw their water requirements from the concessionaires whose sources of water are not from underground resources of Metro Manila.

We note that Dr Lagmay's satellite-borne interferometric synthetic-aperture radar based map shows a big "universe" in Metro Manila and not site specific data pointing to the specific site of the reclamation project. (Please refer to the chart on page 21)

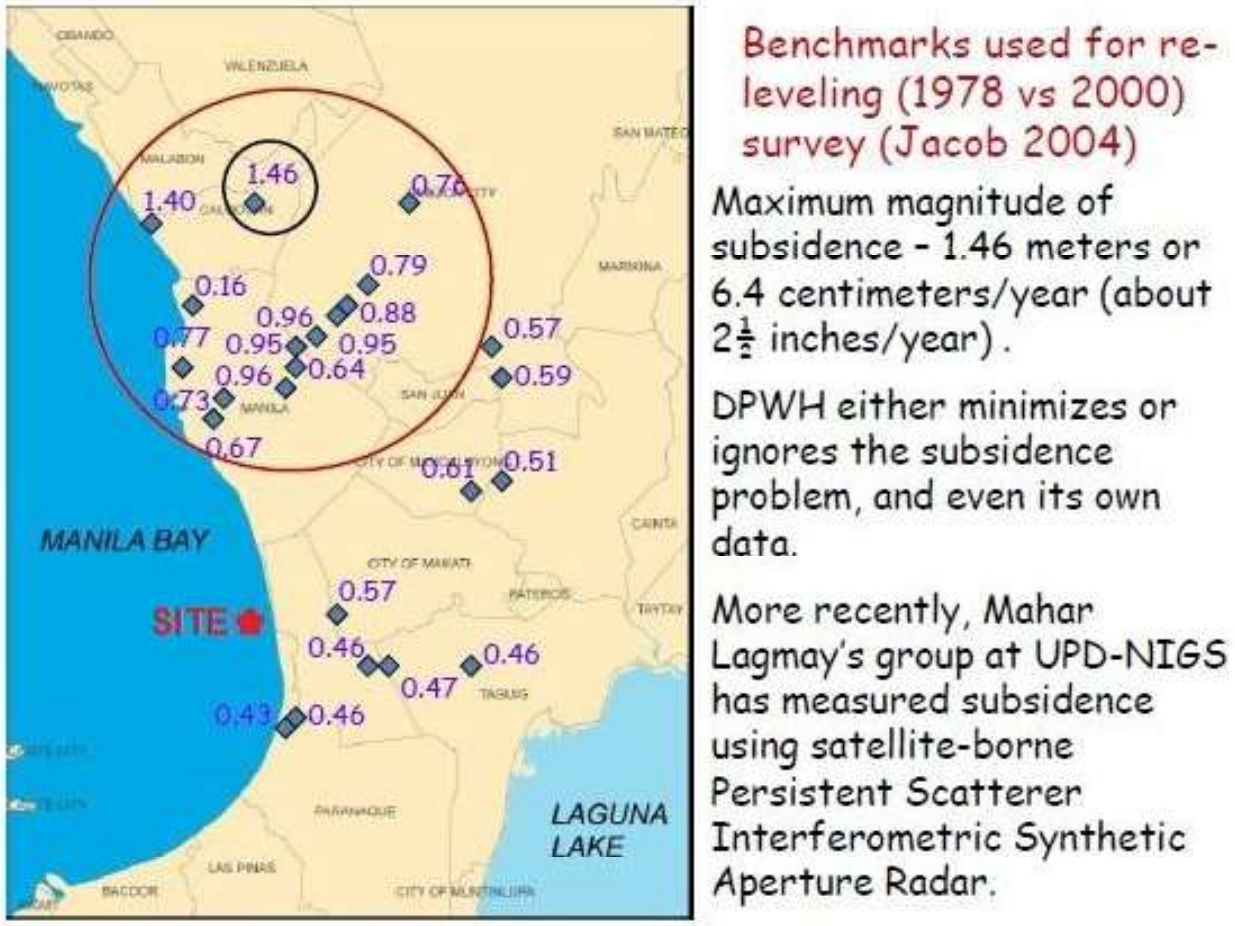


Chart on Land Subsidence in Metro Manila

Flooding and Storm Surges were explained in the presentation and in the Q & A .

Note 15. Issues on Ruby Tower

In the 1968 earthquake, the total structural collapse (by "pancaking") of the Ruby Tower in the 1968 earthquake was not due to ground liquefaction. Even though the subsoils beneath the mat foundation indeed had the potential to liquefy, there was no indication that the foundation of the structure had sunk. Neither were there ground manifestations that liquefaction had taken place like sands boils, water fountaining, etc. unfortunately, no instrumental records of actual ground motion amplitudes are available but it seems reasonable to suppose that presence of the week subsoils amplified ground vibrations during the event. The Integrated Bar Association building in Intramuros suffered a similar type of failure. But again tell-tale signs of ground liquefaction were not found. Subsequent detailed analysis showed that both buildings violated some code requirements for seismic resistance and also had serious designs and construction defects.

The 1990 North Luzon earthquake did result in widespread ground liquefaction even in relatively distant newly reclaimed foreshore areas in Metro Manila, although to a much lesser degree. Only some minor cracks, and sand boils, and ground subsidence had occurred.

The studies on liquefaction were started by Dr Leeds following the liquefaction suffered durintiog the 1961 earthquakes in Alaska and Niigata (Slide 55). The scientific evaluation from these studies were not applied to the 1968 Ruby Tower disaster.

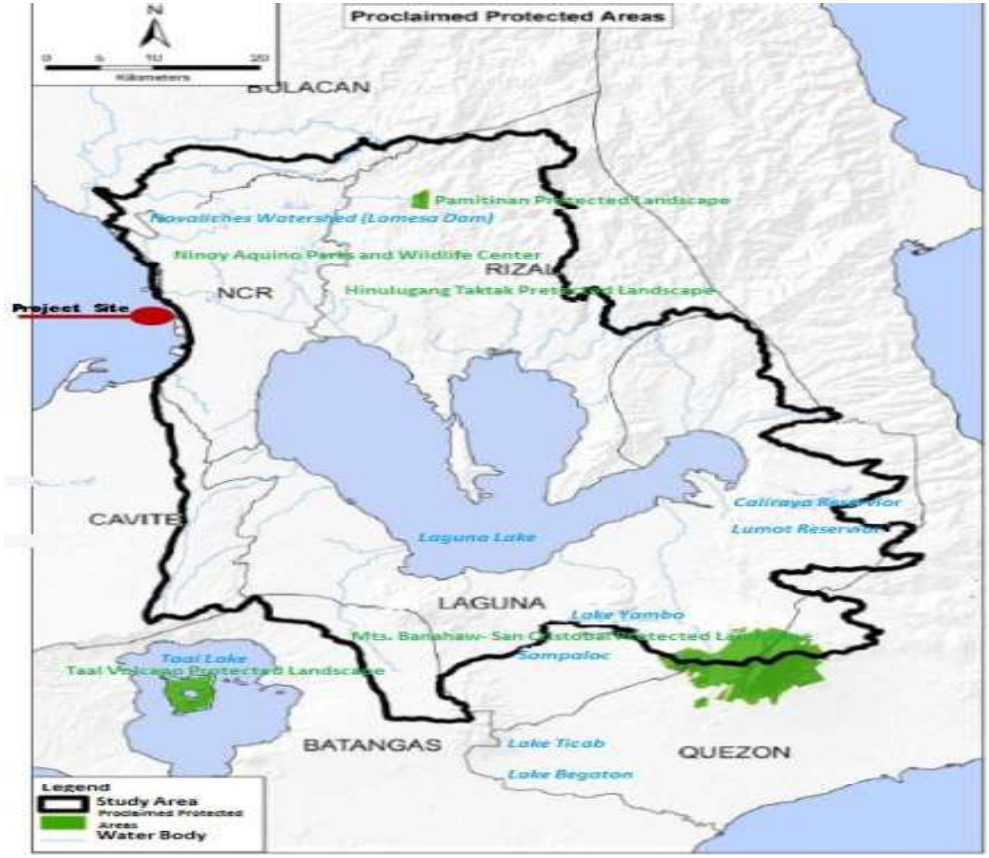
In any event the main argument is that risks are site-specific and the Ruby Tower and the Pasay Reclamation involve different sites distant from each other.

Lessons from the Ruby Tower Disaster and from disaster experiences cited by stakeholders during the Public Hearing will in fact provide good reference for the Design and Engineering Detail, post ECC.

Note 21 Note NIPAS Act

Page 2.1-4 of the EIS Report shows the map of the NIPAS-Protected Area.

This is shown in the map below where it may be seen that the project site is outside the ECAs.



Note 22. Flooding in Pasay

This matter was sufficiently discussed in the Presentation and in the EIS. The main arguments are:

The Reclamation Project does not block, impede nor disturb the drainage system nor the storm flows.

More importantly, post ECC, the International Consultant of the Project will develop more detailed mathematical modeling showing how storm flows direct to the project and how the reclamation configuration will not impede the flow of water from the drainage system.

Note 24. Land Subsidence Observed in Metro Manila

Note 25. The created land will subside.

These have been sufficiently discussed during the Public Hearing.

Slide 41 is further elaborated as follows:

Reclamation Methodology

> The reclamation method which will be used is typical of other reclamation projects worldwide and is widely accepted and approved by oversight government bodies. The prospective Reclamation Contractor will be selected on the basis of experience particularly in Manila Bay or in similar sites, equipment to be used and financial capability to provide assurance of responsibility for the works.
>
> For this project, the platform will be designed with an elevation of +4.0 MLLW. The filling depth will range from
>
> -8.0 MLLW to the deepest depth of about - 8.5 MLLW.

Marine sand, which will be dredged from a sand burrow area near Cavite's San Nicolas Shoal, will be the principal filling material. Alternate sources are available. As an initial statement, the marine sand will be loaded inside trailer suction dredgers and bottom dumped at an identified rehandling pit near the reclamation area. The stockpiled fill material will be distributed by a cutter dredger at the farthest location of the reclamation. Steel pipes will be used to transport theur sand and water slurry to the shallow part of the seabed. Floating devices will be attached to these pipes to keep them afloat for ease in maneuvering. At the same time, swampy bulldozers and excavators will be used to move the stockpiled fill material to its final place. When the reclamation reaches the areas where the trailer dredgers cannot reach, rainbowing method will be used to dispose and spread the sand.

During the reclamation process, the weight of the fill material will press the mud and the other soft materials resting on the surface of the seabed. The mud will be pushed away from the project area towards the open areas of the Bay. Later, when the platform has reached its designed boundaries and elevation, the displaced mud will be dredged and loaded in barges and will be dumped at identified mud pit areas at the deep waters of the Bay.

Upon completion of the platform, a seawall will be constructed around it to protect the platform from erosion. The seawall will be a combination of rock mound and concrete deflector wall that will rise 1.5 meters above the platform level. Extensive soil improvement works will also be undertaken to improve the quality of the platform and hasten the soil consolidation and compaction of the underlying layers of soil. This is normally accomplished using the twin process of wick drains and surcharging.

The installation of wick drains, made of coiled paper derivatives drilled underneath the ground using drilling rigs, provides passageways for the trapped water inside the soil to move up to the surface. When water is freed, the soil is better compacted and becomes more stable. The drains are spaced based on the design capacity of each wick. The soft texture of the original soil layer and marine sand fill becomes more solid and dense.

Surcharging on the other hand, is the process of adding fill material to the platform up to a certain height or volume, such that the added weight of the fill material can apply pressure to the ground below inducing the displacement and release of water trapped inside the original fill. After some time, these surcharge materials are removed and placed on top of the next area to be consolidated. The final fill level is then surveyed to make sure the designed elevation is maintained. This method also reduces the risk of settlement of structures especially carriageways that are constructed on top of the reclaimed platform.

STABILIZATION OF THE RECLAIMED LAND

After completion of the reclamation works, the resulting land form will be subject to stabilization and monitoring prior to actual construction of vertical structures.

ANNEX D

ANNEX 4

Summary and Conclusions

1.0 The Conduct of the Public Hearing complied with DAO 03-30

2.0 The concerned stakeholders, including those outside the Direct and Indirect Impact Areas were invited giving sufficient time to schedule themselves for the Hearing

3.0 The Venue was a Public Place accessible to private and public transportation

4.0 The Opening Speech of the Honourable Mayor Antonino G. Calixto clearly spelled out the Visions of the City and how the Reclamation Project will support these vision

Equally important, the Mayor committed not only to the protection but also to the enhancement of the environment.

5.0 The issues, concerns and clarifications raised by the Stakeholders were adequately responded to in accordance with the Protocol of the Revised Procedural Manual (DAO 03-30)

6.0 Following the paradigm that "ËCC is a Planning Tool and Not a Permit" it was explained in depth by the EIA Consultant that some of the questions will necessarily be addressed in details during "Detailed and Engineering Design" stage of the Project Cycle. The EIA Consultant explained this process in details.

7.0 For this Project, Project implementation cannot be undertaken on the basis of an ECC alone.

Various permits and clearances will be required by the Philippine Reclamation Authority (PRA) before the Project can be issued a Notice to Proceed.

Based on other similar Projects following agencies may likely be asked to give Letter of No Objection (LONO):

DPWH
PPA
BFAR
DOT
Others as may be required

These agencies will process the request for LONO only after the Project shall have been granted an ECC.

8.0 Ability of Proponent to Manage Public Concerns

The Public Hearing demonstrated the ability of the City of Pasay to manage issues, concerns and perceptions. The Mayor and his Officials participated through the entire proceedings. The Mayor himself answered some of the questions from the participants/stakeholders.

The fact that the Hearing closed at about 2 p.m. whereby no time limit was set for the Hearing is noteable.

Also noteable was the fact that the major issues raised and the stakeholders raising these are the same as in other reclamation projects in Manila Bay adjacent to Pasay's and that these Projects have **been granted their respective ECCs.**

ANNEX E

Photographs of the Public Hearing

- **Registration of Participants**



- **Introduction of Participants (Engr. Joel Polintan – EIA Casehandler)**



- **Opening Remarks of Hon. Mayor Antonino G. Calixto**



- **Portion of Participants**



- **Brief Presentation of the Proposed Project**
  (Presented by Atty. Severo Madrona Legal Officer of Pasay City)



- **Discussions on the EIA Study Results**
  (Presented by Dr. Edgardo G. Alabastro- Pasay City EIA Consultant)



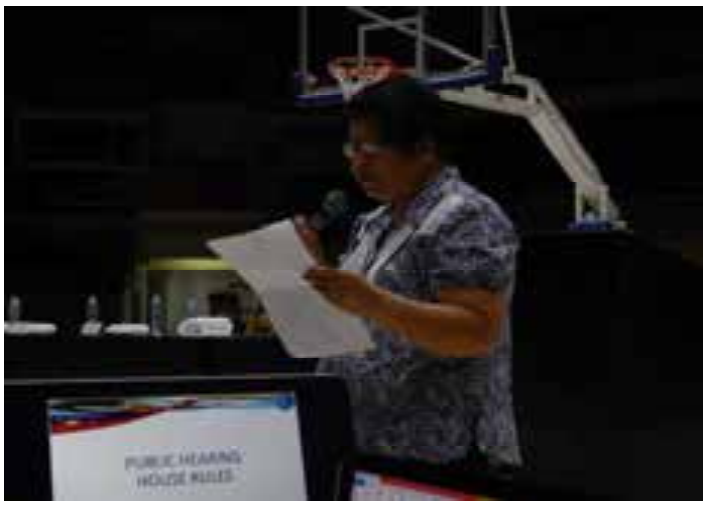
- **Presentation of the Position of Save our Shores Movement by Mr. Harold Ebon**



- **Presentation of the Position of Archdiocese of Manila by Ms. Lou Arsenia**



- **Presentation of the Position of Archdiocese of Manila by Ms. Hailey Saturnino**



- **Open Forum Session**



- **Open Forum Session**
  (The Mayor directly participating and responding to questions)







Prof. Agerico de Villa, Review Committee Chair



- **Open Forum Session**

Engr. Esperanza Sajul, EIA Section Chief –Review & Evaluation



ANNEX F

BARANGAY NO. ~~176~~ ZONE NO. ~~IV~~ DISTRICT NO. 2

POSITION	NAME	ADDRESS	CONTACT NUMBER
[redacted]	EDMUNDO Reyes	400 M.A Felix ST PC	0905 442 5807
[redacted]	Mar Arales	Brgy. 72	0917-421-2367
[redacted]			
[redacted]			
[redacted]			
[redacted]			
[redacted]			
[redacted]			
[redacted]			
[redacted]			

BARANGAY NO. 185 ZONE NO. 17 DISTRICT NO. 2

POSITION	NAME	ADDRESS	CONTACT NUMBER
[redacted]	Rosano Rosahal	188 V. Cruz St. Malibay	09995497797 Brgy 170
[redacted]	Nenita T. Bonon	2138-A Dewey St. Pasay-95	0915 [illegible]
[redacted]	PATERNO MINGUEL	Brgy 30	09212059923
[redacted]	Capt. Mary D. Pedrosa	Brgy 53 Zone 07	0915-2723744
[redacted] 185	Kgd. Benjamin Paranggua	319 Almazor St. P.C.	09322289625
[redacted] 19-20	EDMUND SOLIS SR.	15 Electrical Road P.C.	853-21-89
[redacted] 63/8	NESTOR M. TEPORA	24 Honorata St. P.C.	09275826174
[redacted] Brgy 183	Lolita T. Cruz	641 Bambam St. P.C.	09236108226
[redacted] Brgy 172	Jester John Torralba	825 I. Santos St. Malibay, Pasay	09177511906
[redacted] Brgy 82-10	BERNIE RUIZ	89-E Maricaita St. P.C.	09266241889

TOTAL # 13 + 341

BARANGAY NO. 134 ZONE NO. 15 DISTRICT NO. 2

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN 81-10	PBL Abdsem	2729 P. Villanueva	7103625
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO. 137 ZONE NO. 15 DISTRICT NO. 2

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	Marcelo L. Rank	1034 - Champaca St	09248455479 -
KAGAWAD	Ma. Emmalyn L. Arinzon	76 Champaca St. B.L.	09268317355
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO. 138 ZONE NO. 15 DISTRICT NO. 2

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN 155	JERMIE MALAM	VIRATA	
KAGAWAD 147	RAMON G. BONIFACIO	2908 CRUZ ST. PC.	09274161545
KAGAWAD 138	Kap. Mary Ann Aquino	64 Bautista st.	09267171460 mary aquino
KAGAWAD	ESMERALDA Q. PINEDA	628 gumtan St.	09324727414
KAGAWAD	GREG RAFAS	2042 CRUZ ST.	09176375204
KAGAWAD			
KAGAWAD			
KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO. 139 ZONE NO. 15 DISTRICT NO. 2

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	BONNIE PALMOS	6006 BAUTISTA ST	09/5508/585
KAGAWAD	ATTY PALMOS	606 BAUTISTA ST	0906 255 2800
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO. 140 ZONE NO. 15 DISTRICT NO. 2

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	Rosalind E. Picpic	604 Espiritu St Quiapo P.C.	09061986792
KAGAWAD	I		
KAGAWAD	Eleuterio Adajar	2712 Cabrera St	09077046944
KAGAWAD	MANOLO TORRES	42 VERGEL EXT P.S	
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
SECRETARY	sick mother		
TREASURER	JENALYN RICARDO	3800-E Vergel Ext. Pasay City	09287758700

BARANGAY NO. ~~156~~ ZONE NO. ~~17~~ DISTRICT NO. 2

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	Luis R Santos	49 - Zone 7	851-36-18
~~KAGAWAD~~	KAP Anee Calupig	159 - 17	847-20-23
KAGAWAD	Eulogio Herice	159-17	358-90-40
KAGAWAD	Gringo macario	159-17	9856067
~~KAGAWAD~~	~~[illegible]~~ C. MARIANO	159-17	
KAGAWAD	MYRNA F. TUPAZ	BRGY. 181 ZONE 19	09497162088
KAGAWAD	Belma R. Sangalang	830 B. Mayor M.P.C Brgy 177-B	09772054253
~~KAGAWAD~~ KAG	JULIE B. TIEMPO	747 Lucban St. P.C Brgy 40	09988814505
SECRETARY			
TREASURER			

BARANGAY NO. 133 ZONE NO. 13 DISTRICT NO. 2

BARANGAY #

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN 73-10	Antonio C. Arguelles	107 Ignacio St. P. C.	551-5699
KAGAWAD 133	BENEDICTO C. VILLANUEVA	2041 M DELA CRUZ ST, PC	09154910554
KAGAWAD 133	ALAIN J. LIMIN	613 PROTACIO ST. P.C.	5538042
KAGAWAD 201	KAP. ALEX LOBO	KALAYAAN P.C.	09153062716
KAGAWAD 73	Reynaldo dela Cruz	26 - Ignacio St PC	09085957411
KAGAWAD 79	KAP. DEXTER GM.	2851 TAFT AVE.	09202884493
KAGAWAD CHAIRMAN 108	KAP. MACOY ERENA	519 Tengco St. PC	0949-37-33-103
KAGAWAD			
SECRETARY 133	MA. LUISA A. DE LEON	613 PROTACIO ST. P.C.	09153780330
TREASURER			

BARANGAY NO. 131 ZONE NO. 13 DISTRICT NO. _____

BARANGAY NO.

POSITION	NAME	ADDRESS	CONTACT NUMBER
~~CHAIRMAN~~	Noel P. Octavo	Gpt 16 de Agosto St.	09275748682
~~KAGAWAD~~	Ronaldo Andres	H 2515 m dela Cruz St.	
~~KAGAWAD~~	Marcelino dela Rosa	2524 TOLENTINO St.	~~Tolentino~~ Pan
~~KAGAWAD~~			
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~~KAGAWAD~~			
~~SECRETARY~~			
TREASURER			

BARANGAY NO. 157 ZONE NO. 16 DISTRICT NO. _____

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN			
KAGAWAD			
KAGAWAD	LUIS E. CONDE	704-A97 AREW CRUZ 9, PASAY	09083778683
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO. [redacted] ZONE NO. 19 DISTRICT NO. 1

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	PIO E. ARCE	1851 SAN LORENZO ST	664-20-19
KAGAWAD 78	ROBERTO CUSTODIO	5030 AGATHA ST. P.C	09127598382
KAGAWAD 162	BONITA B. TOGERERA	05 Kapisanan St. Malibay PC	09017061769
KAGAWAD 162	Emelda A. Tobi	54 Kapisanan St Malibay P.C.	1 1
[redacted] PB.	DANILO SJ FRANCO	919 B. V12 CAREA ST	0906 413 9326
KAGAWAD 13	DANILO PLATILLA	2297 PB GARRISON ST.	
[redacted] Secretary PB	ADRIANNE M. DIA	66 sta Escolastica st P.C	09093067192
KAGAWAD 16	AMELITA OSIS	165 - P. Gomez St. PC.	09399193199
SECRETARY 162	Rolando D. Dela Cruz	03-Kapisanan St. M.P.C.	0906/4851979
TREASURER 13	Maricar Baguila	2 2a Sta. Escolastica	09344595212

BARANGAY NO. 98 ZONE NO. 14 DISTRICT NO. 2

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	ALEJANDRO ACABADO		
KAGAWAD	DELFIN LACOBA	BRGY. 78	09292287996
KAGAWAD	SOCORRO BARLIS	BRGY 78	
KAGAWAD 186	PUTCH S BUSONG	BRGY 86	09106388034
KAGAWAD	ANTONIO VALENCIA	BRGY. 86	09164258241
KAGAWAD	OFELIA R SOLARION	BRGY - 16-01	09949149299
KAGAWAD	TRINIDAD A SALVOZA	BRGY- 10-01	09072706054
KAGAWAD	Bebina Taraza	BRGY - 73	552-10-41
SECRETARY	RASUL SULTAN	BRGY- 79-10	
TREASURER	Norhasim Mohmen	Brgy-79-10	

BARANGAY NO. 145 ZONE NO. 16 DISTRICT NO. 1

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN			
KAGAWAD	RONNIE CRUZ	B 19 L9 20 Ramayana St. Sauyo Pr.	09996618279
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO. 146 ZONE NO. 16 DISTRICT NO. 1

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	ANTONIO L. ROJAS	EDSA, PASAY	0917 893 13 50
KAGAWAD	ROLANDO SALVA	PASAY	09434140320
KAGAWAD	NOEL FRANCISCO	PASAY	553 25 02
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
SECRETARY	ANGELITO BIBAS	EDSA PASAY	09178462368
TREASURER			

BARANGAY NO. 147 ZONE NO. 16 DISTRICT NO. 1

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	Jonar Arancha	2417 C. Cruz ST. Pasay City	09157197804
KAGAWAD	Pilar Felipe	2917 C. Cruz St. Pasay city	09291468788
KAGAWAD	Marietta Sebastian	2912 C Cruz St. P. C.	09276143872
KAGAWAD	Lolinda V. Diamante	2915 C Cruz St Pasay City	09392282991
KAGAWAD			
KAGAWAD			
KAGAWAD			
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KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO. 148 ZONE NO. 16 DISTRICT NO. 1

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
SECRETARY			
TREASURER	LILIBETH FULGAR	62 DON CARLOS REVILLA ST, F.C	09281154603

BARANGAY NO. 152 ZONE NO. 14 DISTRICT NO. _____

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	Michael c. del Rosario	672 Int 6 Sta P.C.	0920 - 902 694
KAGAWAD	Danjay O. Logrono	2940 Apelo Cruz St. P.C	09106145167
KAGAWAD	ARTEMIO ARDEÑO	2940 Apelo Cruz P.C	
KAGAWAD			
KAGAWAD			
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KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO. 153 ZONE NO. 14 DISTRICT NO. _____

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	Antonio Trillanes	618 J. Isidro St. Edang	
KAGAWAD	RAYMUNDO F. HIDALGO	557 C. PADILLA ST, EDANG	
KAGAWAD			
KAGAWAD			
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KAGAWAD			
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KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO. 154 ZONE NO. 14 DISTRICT NO. _____

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN			
KAGAWAD	SHERWIN ARBISO	612 J. LUIS ST. PC	0915 954 4150
KAGAWAD	Lolita C. Javier	557 EDANG ST. PC	078-58-29
KAGAWAD			
KAGAWAD			
KAGAWAD			
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KAGAWAD			
KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO. 154 ZONE NO. 16 DISTRICT NO. 1

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	EFREN SILVA	116 VIRATA ST. PC.	09202829075
KAGAWAD 1			
KAGAWAD 2	TOTO CONTRERAS	174 VIRATA ST. PC.	09087599655
KAGAWAD 3			
KAGAWAD 4			
KAGAWAD 5			
KAGAWAD 6	WALTER ASPHIS	132 VIRATA ST. PC.	09471962676
KAGAWAD 7			
SECRETARY			
TREASURER			

BARANGAY NO. 154 ZONE NO. 14 DISTRICT NO. _____

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	REINARDO CRUZ SERRANO	333 RIVERSIDE TRONO ST. P.C.	0919 204 1448
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD	GINA M. TAMPAN	704 B-12 Apolo Cruz St. Pasay City	09965357998
KAGAWAD			
SECRETARY	DANILO O FRANCISCO	704 B-37 APOLO CRUZ ST. PC.	0947 2233 211
TREASURER			

BARANGAY NO. ~~[illegible]~~ ZONE NO. ~~[illegible]~~ DISTRICT NO. _____

SITION	NAME	ADDRESS	CONTACT NUMBER
AN 189	ERNESTO FERNANDEZ	207 I. REYES ST. P.C.	889-237
199-24	P/B DANIEL P. DETERA	Riviera Village, NAIA, PASAY CIT	0919-6807299
RSN 180	ANTHONY TAGLE	513 SAPPHIRE ST. MARICAWAN P.C	
169 R9	MARVIN HERNANDEZ	120 TWN PIONEER ST. P.C.	09185818141
N 39	RAFAEL TUNI	227 DANCEL ST.	09066017926
	EDITA ROMANERA	2438 DECENA ST. P.C	0947 008 84 48
N 149	Evangeline C. Lanion	862 Edang St. PC	09176969552

BARANGAY NO. 99 ZONE NO. _____ DISTRICT NO. _____

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN 99	FE CASTAÑEDA	215 P. LOPEZ ST. P.C	[illegible] 552-94-57
KAGAWAD 99	SUSANA B. VILLAFUA	203 VERGEL ST. PARAY	552-94-52
~~KAGAWAD~~			
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~~KAGAWAD~~			
SECRETARY 99	Michelle O. Magpatoc	209-C Vergel St. P.C.	09094019197
TREASURER			

BARANGAY NO. 118 ZONE NO. 14 DISTRICT NO. _____

SITION	NAME	ADDRESS	CONTACT NUMBER
AN	118 ALFREDO CABRERA	567 I. REYES ST.	09291252347
AD	118 LITA RIVERA	567 I. REYES ST	09161157621 Rivera
AD	118 Robert Francis A. Be Ryan	507 EDCA P.C.	09168441287
EF			
AD			
AD			
AD			
EI			
AY			
ER			

BARANGAY NO. 100 ZONE NO. _____ DISTRICT NO. _____

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	C. MANGALINO	2284 Tramo St.	09272457368 Cpmangalino
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
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KAGAWAD			
KAGAWAD			
KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO. 114 ZONE NO. _____ DISTRICT NO. _____

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	Ariel Concepcion	2419 Cabrera st 1C	09193571481
KAGAWAD	Romel Aguilar Febre	2419 Cabrera st 1C	09064470498
KAGAWAD			
KAGAWAD			
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KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO. 113 ZONE NO. _____ DISTRICT NO._____

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	IRMA SUNLAYAN		
KAGAWAD			
KAGAWAD			
KAGAWAD			
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KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO. 115 ZONE NO. 14 DISTRICT NO. 2

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	LARA RIZOS		
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO. 116 ZONE NO. _____ DISTRICT NO. _____

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	MIRO JR.		
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO. 97 ZONE NO. 14 DISTRICT NO. 2

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	JOSE ANG		
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO._____ ZONE NO. _____ DISTRICT NO._____

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN			
KAGAWAD 76	RICARDO B. QUINES JR	10 RUSSEL ST DASMA CITY	09494A3204
KAGAWAD 24	OSCAR BACANI	146 Villamor St. PC.	551 65-80
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO.____ ZONE NO. 01 DISTRICT NO. 01

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN Kag. 17-2-1	Maria Ruth B. Banaag	175 Gutierrez St.	0920 871 1477
KAGAWAD Kag-17-2-1	Raymon M. Laygo	175 Gutierrez St.	09155650815
KAGAWAD 41 Kag.	Edgardo F. DIZON	186 P. DeMayo	09351350471
KAGAWAD 172 - Senior	Violeta B. Fernandez	842 I. Santa M. P.C.	09334892369
KAGAWAD 4-10 GS	ROSARIO MORALES	STA MONICA 10-4	831-54-51
KAGAWAD			
KAGAWAD			
KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO. 30 ZONE NO. 05 DISTRICT NO. 1

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	RANIL S. BARCENAS	57 PROPRIETORIOS ST. P.C.	09185131450
KAGAWAD	Herminia (A) Antiquina	133 P. Manaftan	
KAGAWAD	Arlina Buenaventura	133 P. Manaftan	
KAGAWAD	Elizabeth Lim	160 Propitas 1045	831-62-75
KAGAWAD	Ma. THERESA F. VERON	129 P. MANAHAN O. 1.1.	09004426189
KAGAWAD	FRANCIS P. BELARMINO	APT. 11 MARIMO ST. P.C.	09477782538
KAGAWAD			
KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO. 29 ZONE NO. 05 DISTRICT NO. 1

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN 29	[illegible]	[illegible]	[illegible]
KAGAWAD 29	Rexie Vicente	2269 Lapu-Lapu St. P.O.	[illegible]
KAGAWAD			
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KAGAWAD			
KAGAWAD			
SECRETARY			
TREASURER			

BARANGAY NO. 07 ZONE NO. 02 DISTRICT NO. 01

SITION	NAME	ADDRESS	CONTACT NUMBER
[illegible]	Emmanuel ARLAN	2528-B Villanueva St. P.C	09998038169
[illegible]	LUZVIMINDA TERESONIB	143 Capt Ambo St P.C	09497191968
[illegible]	ARLINL AMBROSIO	1707 TAFT AVE. P.C.	09998805390
[illegible]	Kep Milma Agusta	2614 F.A Harrison P.C	09213494341
[illegible]	Kag Claro Agustin	2614 " " "	09294681266
[illegible]	LAL GRACE GRIJNPOPE	2281 Doris Nimeng St P.C	09276506527
[illegible]	FRANCISCO J. GAYAN	2/A F.A HARRISON ST PC	09?1401233
[illegible]			
[illegible]	Josefina Umbaud	1961 Dapitan St. P.C	09195128476
[illegible]			

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(33) + 1 + 3 + 1 + 1

BARANGAY NO. 49 ZONE NO. 6 DISTRICT NO. _____

NO.	NAME	ADDRESS	CONTACT NUMBER
	eddie Cruz	Prugy. 13, Zone IV	550-92-69 / 823-39-16
	ELMER SANTOS	2645 CABRERA P.C.	09193[illegible]6251

BARANGAY NO. [illegible] ZONE NO. [illegible] DISTRICT NO. [illegible]

POSITION	NAME	ADDRESS	CONTACT NUMBER
Brgy adm			
CHAIRMAN			
KAGAWAD 182	EDDIE D. AGUSTIN	[illegible]	09073674622
KAGAWAD 184	MA. CONSUELO [illegible]	[illegible]	880-49-35
KAGAWAD 184	ARMANDO P. RICAFORT	[illegible]	880-49-35
KAGAWAD 184	KAREN CIRIA	[illegible]	880-49-35
KAGAWAD 196	RENATO DUAT	PLUTO [illegible]	8517667
KAGAWAD 181	OLIVIA R. SUAREZ	Brgy. [illegible] 181	852-0655 / 09358720335
KAGAWAD 84	Capt. E. Tanega	Brgy. 84	832.08.27
SECRETARY 182	P/a H. [illegible]	Brgy 182 2-19	401 51 25 09157865424
TREASURER 189	KAGAWAD ARNOLD GABRIEL	BRGY 189-220	09397283483

BARANGAY NO. ~~183~~ ZONE NO. ~~40~~ DISTRICT NO. _____

POSITION BARANGAY IT	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN			
KAGAWAD Brgy-Cod	Leah h. Soria	520 Tenga St Pasay city	09307937676
KAGAWAD B-110-12	KGWD. FREDDIE CABM	2043 INT. TRAMO ST. P.C	0921-478-1760
KAGAWAD B-41/06	Yolanda M. Aspa	307 D. 15 de Noviembre	09281603P1
KAGAWAD 193	Jonas G. Bautista	682 346 R. Pue E P.C	853-6275
KAGAWAD 187	Kag. Veronica N. Namay	76 Chamorro St. P.C	8436194 Kag-ay
KAGAWAD 137	Kag Rosa J Languyan	49 Dungon-gista St. P.C.	853-64-94 Kag-Languyan
KAGAWAD 151	Kag. Rolan G. Lawrente Jr.	321 EDANG St. Pasay City	
SECRETARY 96 Z-11	KAG. HORECCA A. TAYCO	2589 ZAMORA ST. P.C.	831-5942
TREASURER BRGY 172	KAGAWAD ALEXANDER S. PITEL	968 GERONIMO ST. MALIBAY P.C.	0921 300 2371

BARANGAY NO. 184 ZONE NO. 19 DISTRICT NO. _____

BARANGAY #

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN BGY 182	ROBERTO E. SALDO	2514 CANOY	09397122978
SECRETARY Brgy. 194	Rufita D. Rosario	9020 Ogida Cmpd Est. Malibay, P.C.	09260524621
KAGAWAD			
KAGAWAD BRY. 184	TEDDY RUSALES	BRGY. 184 ZONE-19	09155026144
KAGAWAD 76	Jean Rokas	9 Hernandez Ave. P.C.	09177504459
KAGAWAD 5	PABLITA LOGRO	11 NOVELDES ST. PASAY CITY	09277922700
KAGAWAD 40	NOEL MEÑA	3345 LUNA ST. P.C.	09179556287
KAGAWAD 142	Ronory Dioko	315 San Rafael St. P.C.	
SECRETARY			
TREASURER			

BARANGAY NO. 129 ZONE NO. 18 DISTRICT NO. _____

BRGY. 129

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN 129	Rosario R. Arriesgo	616 Bagumbayan St. P.C.	09086240663 Arriesgo
KAGAWAD 106	GEORGE S. CELARIO	424-B TANGO ST. P.C.	
KAGAWAD 127	Daniela N. Reyting	2 Alvarado St. P.C.	09162115510
KAGAWAD 129	Antonio G. Cortaleza	6 Concha St. P.C.	09476240146
KAGAWAD 64	LUIS V. ANTONIEVO	214 F. SANCHEZ ST. P.C.	09158228590
KAGAWAD 177	HERMENIO USON JR.	871 B. MAYOR St.	09983076589
KAGAWAD 182	Rodolfo G. Manzala	253 Mulawin Makiskan P.C.	093-297 47[illegible]
KAGAWAD 40	FREDERICK F. RNP	2354 LEVERIZA ST. PC.	09155663379
SECRETARY 184	CELESTINO V. MATAYA	MALICAKAN P.C	09262318986
TREASURER 186	JOSEFA "JOJO" LEDESMA	26 AREA B CREST CLINIC COMP TRANS	09771631644

BARANGAY NO. [illegible] ZONE NO. 19 DISTRICT NO. e

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	Julie A. Ramos	192C. Quezon St. P.C.	
KAGAWAD BARLOY 51-28	ERIC I. BESORO	2142 ALVAREZ ST. P.C	09153869698
KAGAWAD 185	Gemma. A. Solis	176 Pag-asa St. P.C.	555-18-26
KAGAWAD 144	NOLLIE BOW	[illegible]	[illegible]
KAGAWAD 84	RICARDO V. ANDNIEVO	256 F. SALAZAR ST. P.C.	09395383237
KAGAWAD 189	[illegible]	45 BRGY 181, PASAY CITY	[illegible]
KAGAWAD 192	Capt. Lolito M. Ramos	0520 Pildera 1 Mla P.C.	09483960250
KAGAWAD	EDITHA BALAORING	584 Bayanihan P.C.	
SECRETARY 181	ESTER P. TALOSIG	#606 SAN LORENZO RUIZ ST.	0935-4557166
TREASURER			

BARANGAY NO. [redacted] ZONE NO. _____ DISTRICT NO. _____

SITION	NAME	ADDRESS	CONTACT NUMBER
IAN	WILFREDO DELA ROSA	63 EMMA St. P.C	09379184209
AD Kap.	REGALADO MIGUEL	28 F. VICTOR St. P.C.	
AD	ROBERTO B CHAN	Brgy 189 ZONE 16	09327169492
AD KAP.	ANTONIO A TRESTIZA	BRGY. 153 ZONE 16	
AD KAG.	RAYMUNDO F. HIDALGO	BRGY. 153 ZONE 16	
AD	Jacqueline A. Jacalne	Brgy 181 - 19	09958991779
AD			
AD			
MY			
BER			

BARANGAY NO. 177 ZONE NO. 11 DISTRICT NO. _____

SITION	NAME	ADDRESS	CONTACT NUMBER
177	REYNALDO BOSABAL	Cabreza	
	JUAN PAUL D. PASCUA	E. Rodriguez Ext. Malibay, PSAY City	09994402239
144	Margie P. Jordan	E. " " " Pasay city	09483486359 Mjordan
94	Jim T. Palomares	2441 Decena St. PC.	
110	LUZ SANTOS	521 Inocencio St. P. C.	
76	Rose H. Guamos	Dewham St. P. City	
124	Bonc Brgy	Tel # no - Active	
177	WILLIAM TABOZA	6410 B. MAYOR ST MALIBAY PC.	09164657647

BARANGAY NO. ~~1810~~ ZONE NO. 19 DISTRICT NO. 2

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	RUEL RAMOS	BRGY 185-2-19	09089288228
KAGAWAD	JOFREY GAMON	NO2 MATUNOG ST. P.C.	0927-4514479
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
KAGAWAD			
SECRETARY			
TREASURER	Melody C. Bautista	96 KOW St.	0917 504 3379

BARANGAY NO. [illegible] ZONE NO. [illegible] DISTRICT NO. 1

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN [illegible]	An		
KAGAWAD 191	Antonio C. Bollo L	927-19 de Agosto St.	09997119714
KAGAWAD 94	Eduardo Ramos	2481 DECENA ST P.C	09082965050
KAGAWAD 166	WENCESLAO SIGALES	748 S DE GUZMAN ST PC	09219507621
KAGAWAD 165	SANTIAGO A. MONTALBO	751 E. RODRIGUEZ M PC	09165294870
KAGAWAD 107	NARCISO D. CECAPIT	2006 TRIANO ST. P.C.	09192516765
KAGAWAD 178	EFREN Y. CALURA	43 SNT AGUSTINE H P.C.	09052053477
KAGAWAD 173	LEO GARCIA	6 calle san sebastian P.C.	09157196209
SECRETARY 183	ALAN IBONOS	BRGY 183 ZONE 20 P.C.	09163478264
TREASURER 95	GODOFREDO M. MAGI	2459 DECENA ST. P.C.	09461402472

BARANGAY NO. [illegible] ZONE NO. [illegible] DISTRICT NO. [illegible]

POSITION	NAME	ADDRESS	CONTACT NUMBER
BRGY KGD			
[illegible] 18	VIVIAN U. AREVALO, JR.	128 SAMPAGUITA ST. PASAY CITY	0906 223 9221
KAGAWAD 101	JOSE JOSELY A. JOZADA	618 TOLENTINO ST. PASAY CITY	0906-487-3219
KAGAWAD 103	HON. MELANIO CONCEPCION	427 D. JAVIER ST. PASAY CITY	0917 880 5509
KAGAWAD 107	Purgatha de Leon	2439 TRAMO St. P.C	09213237860
KAGAWAD 110	NOEL TIAZON	2032 TOLENTINO ST PC	09272169340
KAGAWAD 120	REYNALDO CHANCO	2114 AURORA ST. P.C.	09268494297
KAGAWAD 125	ROGELIO ORTICIANO	563 J. LUNA ST P.C	09165563720
[illegible] 85	ROMY CASTRO	2647 P. VILLANUEVA ST. P.C.	09393783834
SECRETARY 162	~~ANTONIO ESCALONA~~ NO 771 E. Gonzaga, Malibay, P.C.		~~09285679~~
[illegible] 163	Zenaida Manalo	745 Velasco St. Malibay PC	09279781503

BARANGAY NO. ~~184~~ ZONE NO. ~~48~~ DISTRICT NO. ~~6~~

POSITION	NAME	ADDRESS	CONTACT NUMBER
BRGY NO -	Virgilio Salvador	67 Geronimo Umali Bay.	09183918855
CHAIRMAN 173			
KAGAWAD 78	GOMER E CAHIRA	143 B-CAPT. AMBI ST.	0920-603-1308.
KAGAWAD 155	Rodolfo Patino	104 Vicente St.	
KAGAWAD 106	Armando Rayca Delos	414 TANGCO ST P.C	09159457943
KAGAWAD 53	Baltazar Reyes	2160 P. Burgos ST - P.C	8318369
KAGAWAD 155	DELFIN CALICIA	114 VICENTA ST. P.C.	09202X290773
KAGAWAD 87	DANILO M. GOMEZ	2546 P.VILLANUEVA ST. P.C	09212010188
KAGAWAD 68	BONG SEMIX	2429 CANCER ST.	09154738532
SECRETARY 76	JOSEPH M. MABUNAY	#26 NUBIA ST. PASAY CITY	854-0012
TREASURER 76	DIOSDADO L. SAMPANG JR	#20 KAMPIL. PASAY CITY	09151141/8309

BARANGAY NO. ~~175~~ ZONE NO. ~~56~~ DISTRICT NO. ~~2~~

POSITION	Book NO	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	67	TELICITAS B. OLIVARES	5 DIAN ST. P.C.	09165[illegible]177
KAGAWAD	119	DELFIN M ALCANTARA JR.	250 VERGEL ST P.C	09260441567
KAGAWAD	62	Angelina C. Xavier	29-J. Vicente St. Tc.	09193288485
KAGAWAD	52	Rogelio Lopez	21 Lourdes St Re	
KAGAWAD	90	PERFECTO POLICARPIO	266 A. PRIMICIAS DOMADO ST. PC	0977-373-2093
KAGAWAD	113	ARMANDO T. CLAUDIO	2719 DIMASALANG ST P.C	09151951163
KAGAWAD	57/13	Gil Hernandez	2744. P. Pio Villanueva	09179976030
KAGAWAD	151	Benita Collado	319 Edang St. Pasay city	0993 528 0171
SECRETARY	112	MARCISO B. COSTE	915 CAN. ROAD	09497036246
TREASURER	704	Sandra M. Zarate	2102-D M. Dela Cruz St. Malate Manila	09202064433

BARANGAY NO. 177 ZONE NO. [illegible] DISTRICT NO. [illegible]

POSITION	NAME	ADDRESS	CONTACT NUMBER
BRGY NO.			
CHAIRMAN 114	ROMUALDO MIKE DE GUZMAN	664 DIMASALANG ST.	0915-480-1490
[illegible] 12A PB	BRUNDA L. ISIDRO	139 Araiz St. P.C	09064926795
KAGAWAD 111-26	RODOLFO L. UMALI JR	1767-DOMINGA ST P.C.	
KAGAWAD 43	EVELYN R. MATO	COOP	09052839770
KAGAWAD 185	MA. CHARIS PEREZ	012 almaya St. PAL P.C.	09164909016
KAGAWAD 181	ROLANDO S. RAMOS	435-BAYANIHAN 1	09488734265
KAGAWAD 191	Fred Rama	395 Bayanihan	09156820603
KAGAWAD 51	Ms. Bonalyn Alcantara	2124 Alvarez St. Pasay City	09393135759
SECRETARY 185	Grima Lisoa	131 almaya St. P.C.	09391129720
TREASURER 62	ANNA RIZZELLE S. RAMOS	36 F VICTOR ST PASAY CITY	09257405217

BARANGAY NO. 169 ZONE NO. 13 DISTRICT NO. 5

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN 160	[illegible] Jennings	1187 TRAMO ST.	889 3351
KAGAWAD 169	Brigida Bunao	578 P. Hagdang MKC	09309570596
KAGAWAD 169	[illegible]	681 B. Vizcaya St. [illegible] P.C.	09102888137
KAGAWAD 41	[illegible]	3NE-A NT DE NOV ST. P.C	09068437174
KAGAWAD 172	[illegible]	[illegible] ST. [illegible] P.C	09200852 0847
KAGAWAD 156	Nenita Ortega	333 TRAMO RIVERSIDE P.C	09196622403
KAGAWAD 156	Zenia A. Baja	118 Tramo Riverside Brgy City	621 7166
KAGAWAD 124	[illegible]	566 14 NO - ACOSTA ST P.C	09155811263
SECRETARY [illegible]	~~[illegible]~~	MALIBAY	~~85105 87~~
TREASURER 107	Rosanna Hernandez	425 PRIMERO de MARZO ST P.C	09296299554

BARANGAY NO. ~~160~~ ZONE NO. 17 DISTRICT NO. 2

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN 160	JENNIFER S. CLAUDIO	52-C. JOSE ST. MAL. PASAY	09179746411
KAGAWAD 160	MARIA TERESA CRUZ	744 N. Patricio St., Mal., Pasay City	09979119704
KAGAWAD 160	JESSICA M. ONG	771 F. CRUZ ST. MALIBAY P.C.	09773498350
KAGAWAD 173	Rodolfo Federez	008 Geronimo St. MP-C	0926 189 5096
KAGAWAD 174	carmencita a. mendoza	902-F-apuyo street. mp.c	09166681023
KAGAWAD 76	Rosemarie B. San Miguel	#10 Rural St. P. City	09176779268
KAGAWAD 76	ROSITA BARSALIGAN	60 RUBIA ST P.C.	09053222419
KAGAWAD BRGY/CAPT 160	ROGERINO B. LAGAMOTA	184 DALISAY ST. PC	09167185304
SECRETARY 5	Nicanor Precia	25 Lourdes St P.C.	
TREASURER 162	ROMEO ROMAN	617 C OSA	09773753972

BARANGAY NO. ~~194~~ ZONE NO. 19 DISTRICT NO. ~~20~~

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN Admin	SAMSON TAMAYO	BRGY 193- Zone 20	853-62-75
KAGAWAD	ZOSIMA I. DEL MONDO	BRGY. 193- Zone - 20	853-62-75
KAGAWAD 93	Annaliza Fernando	2655 Tapia Ave. P.C	09151486127
KAGAWAD 93	Marites Rocita	2800 Tapia Ave - P.C	09702273462
KAGAWAD 193	MAMALOD CAA	2464 TOLENTINO	
~~KAGAWAD~~ KAP.	NELSON PADILLA	Brgy 141-57	09175331960
~~KAGAWAD~~ Kgd. Julie G Gonzales		Brgy 85-17	
KAGAWAD	SILVERIA B. PANDAY	Brgy 105 2021-11	
SECRETARY	Roxar Global	Brgy 110 - 12	09195
TREASURER	ROSE MELLISSA DEXRO JUANITES	Brgy 155	

BARANGAY NO. [redacted] ZONE NO. [redacted] DISTRICT NO. [redacted]

OSITION	NAME	ADDRESS	CONTACT NUMBER
AN	Johnny C. dela Peña	2461 P. Villanueva Pasay	7997571
AD	ARIEL PANTO	41 - ZONE 6	09164979886
AD	FRANCISCO SANTOS	41 - Z - 6	09897885221
AD	Violeta O Diosa	128 Tambunting Brgy 182 Pc	09395780822
AD	ROSELLE ID (CHARO) ANDRADE	0138 ROSAL ST MALIBAY Brgy 182 PC	09062233602
AD	Julio F. MABINI	BRGY 75-10	09486754416
AD	Benito B. Fuentes	BRGY 91-Z-9	09098545212
AD			
URY	GRACIELA C. VILLANUEVA	BRGY 91 ZONE 9	09461990814
BER			

BARANGAY NO. [illegible] ZONE NO. [illegible] DISTRICT NO. [illegible]

SITION	NAME	ADDRESS	CONTACT NUMBER
IAN			
AD	VERDITH M. MANABAT	BRGY 28	0905 7020718
AD	MILAGROS N. BAUTISTA	BRGY 28	09166125838
AD	JUGIF C. NATIVO	BRGY 28	0921 462 1965
AD	NARCISO VERZOLA	BRGY 124	0922 367 1741
AD	[illegible]	BRGY 65 ZONE-02	0905 266 3714
AD	ANTHONY V. [illegible]	BRGY 181 ZONE 19	0975 901 1270
AD	[illegible]	BRGY 194 ZONE 20	0928 249 3611
RY	KAG. ROSITH P. DALIDO	BRGY 51 ZONE 8	0917 699 2099
IER	KAG. MA TERESA PALENCIA	BRGY. 51 ZONE 08	0977 215 1793

BARANGAY NO. ~~NAC~~ ZONE NO. 14 DISTRICT NO. 2

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN 190	Alma D. Pichay	Don Carlos Vill. P.C.	
KAGAWAD 190	Lenie Navarro	Don Carlos Vill. P.C.	
KAGAWAD 70	VICTOR TUBAL	2527 FIGUEROA ST. P.C.	
KAGAWAD 05	Mercy J. Acuña	#15 Lourdes St. P.C.	09773224556
KAGAWAD 90	JAIME ESTROPIGAN	946 PRIMERO DE MAYO P.C	09203402084
KAGAWAD 90	Romeo V. Paguiton	284 Primero de Mayo St P.C.	
KAGAWAD 151	Lourdes Boado	321 edang st pasay city	09199838956
KAGAWAD	Victoria B. Flores	21 H2. 2 M. Adriatico	
~~SECRETARY~~ 136	Gloria L Paloma	13-B BPO St. Camia	0929 700 4801
~~TREASURER~~ KAG. 136	HERMEGILDO R. AYUNGINA	615 INEZ ST. P.C.	09245344951

BARANGAY NO. 180 ZONE NO. 7 DISTRICT NO. 2

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN 180	MAGNO VICENTE	548 OPAL ST BRGY 180 PC	09090832700
KAGAWAD 180	WENCISLAO MANOCCA	564 TUPAZ ST BRGY 180 PC	09336259791
KAGAWAD 180	JESSIE MAGDARAOG	533 RIVER SIDE ST PC	09273867750
KAGAWAD 105	Carmelita Mercado	2391 Tramo Rd. Cor. D. Reyes P.C.	09905093063
KAGAWAD 24	Marissa T. Arroyo	14 Villareal St. P.C.	09212527910
KAGAWAD 185	Maria. Corazon D. Montoya	#042 Riggins St. Marcoban PC.	09063279603
KAGAWAD 97	ROLANDO B. CACOGEO	2542. P. VILLANUEVA. PC.	09999876040
KAGAWAD 140	Lorelyn R. Ramirez	Tanong Cuarta D.C.V. P.	09093270203
SECRETARY 179	Rona Mabbu	Marcoban	09152997330
TREASURER 964	Roberto Mella	2300 Tramo St P. C	0958 5040

BARANGAY NO. 178 ZONE NO. 19 DISTRICT NO. 2

POSITION	NAME	ADDRESS	CONTACT NUMBER
CHAIRMAN	CARLITO ARROJO	BRGY. 178 Z-19	
KAGAWAD	Reuisto O. MALUSAY	BRGY. 03 - ZONE 01	
KAGAWAD	RODOLFO ESTEBAN	BRGY. 165 - ZONE 18	
KAGAWAD 178-19	BAS CR B	309 SAMPAGUITA CT R0-19	
KAGAWAD BHGY	DESMOND DELOCAN	417 Tenedo St. P.C.	
KAGAWAD 178-19	RENE ADONIS	BRGY 178-19	09065912189
KAGAWAD 184-19	JESUS G. ANDRADE	ST. PETER CT. BRGY. 184-19 MARICAPAN P.C.	09083642657
KAGAWAD 185	JESSIE CALATAN	439 O. REYES ST P.C.	0939 8138093
SECRETARY 119	ARNOLD CASTILLEJA	250 Vargas St. Pasay	09082229129
TREASURER 128	Elizabeth Delfin	557 J-Luna St. Pasay City	09163457542

MALACAÑANG
Manila

ADMINISTRATIVE ORDER NO. 224

AMENDING ADMINISTRATIVE ORDER NO. 176, "CREATING THE PRESIDENTIAL TASK FORCE BOULEVARD 2000"

WHEREAS, Administrative Order No. 176 was issued on 14 February 1995 for the creation of Presidential Task Force Boulevard 2000 to prepare, integrate and coordinate all development plans, programs and projects in the Boulevard Reclamation Area;

WHEREAS, the Boulevard 2000 Framework Plan prepared by the Task Force has been approved on 02 November 1995;

WHEREAS, the Task Force has been tasked to integrate in the Framework Plan for Boulevard 2000 projects that will be implemented outside the Boulevard 2000 area, affecting the development in said area and all other concerns which have yet to be specifically addressed by the Plan;

WHEREAS, there is need for closer consultation and coordination with concerned local government units in addressing the problem of relocating displaced families as a result of the implementation of development plans, programs, projects in the Boulevard 2000 area;

WHEREAS, the Philippines will be engaged in several milestone activities such as hosting of the 1996 Asia Pacific Economic Cooperation (APEC) and the Centennial Celebration of the Philippine Independence which are expected to attract foreign visitor;

WHEREAS, there is need to fastrack programs and projects in the area in time for milestone activities to ensure greater impact to foreign visitors;

WHEREAS, the Boulevard 2000 could influence the regional development of the National Capital Region through the introduction of a growth nucleus that will continuously stimulate the activities towards the attainment of a self-sufficient metropolitan community;

NOW, THEREFORE, I, FIDEL V. RAMOS, President of the Republic of the Philippines, by virtue of the powers vested in me by law and the Constitution, do hereby order;

EPLYING, PLEASE CITE:
L951593
L951593

Section 1. Section 2 of Administrative Order No. 176 is hereby amended to read as follows:

"Section 2. **Composition.** The Presidential Task Force Boulevard 2000 will be chaired by the Secretary of the Department of Public Works and Highways (DPWH), co-chaired by the Secretary of the Department Environment and Natural Resources (DENR), with the General Manager of the Public Estates Authority (PEA) as Vice-Chairman, and composed of the following as members:

National Economic Development Authority
National Centennial Commission
Department of Finance
Department of Tourism
Department of Interior and Local Government
Department of Transportation and Communication
Department of Trade and Industry
Presidential Management Staff
Flagship Programs and Projects Committee
Housing and Urban Development Coordinating Council
Bases Conversion Development Authority
Philippine National Bank
Government Service Insurance System
Social Security System
Cabinet Officer for Regional Development for the National Capital Region
Cultural Center of the Philippines
National Parks and Development Committee
Philippine Gaming and Amusement Corporation
Office of the Government Corporate Counsel
Chairman, Metropolitan Manila Development Authority
Governor of Cavite
Mayors of Manila, Pasay City, Parañaque, Las Piñas and the municipalities of Bacoor, Kawit and Noveleta in Cavite
Metropolitan Manila Waterworks and Sewerage System
Five (5) Private Sector Representatives to be recommended by the Task Force Chairman and appointed by the President

Section 2. The life of the Presidential Task Force Boulevard 2000 shall be extended from 14 November 1995 to 14 January 1996.

Section 3. The Public Estate Authority will immediately implement plans, programs and projects in the Boulevard Reclamation Area, in accordance with the Boulevard 2000 Framework Plan;

Section 4. Further, the Public Estates Authority in coordination with the Metropolitan Manila Development Authority and Housing and Urban Development Coordinating Council, will spearhead the implementation of Phase II on the Urban Renewal Program of said Framework Plan for areas adjacent to the Boulevard 2000 area.

Section 5. This Administrative Order will take effect immediately.

Done in the City of Manila, this 14th day of November in the year of our Lord, Nineteen hundred and Ninety-Five.

By the President:

RUBEN D. TORRES
Executive Secretary

November 30, 2015



National statement
of
His Excellency Benigno S. Aquino III
President of the Philippines
for the leaders event of the 21st Conference of Parties in Paris, France

[Delivered on November 30, 2015]

Highlights provided by Dr Ed Alabastro

Excellencies, last February, our good friend President Hollande and I launched the Manila Call to Action on Climate Change. At the heart of this call is the stark reality that countries like the Philippines bear a disproportionate amount of the burden when it comes to climate change. The appeal we made in Manila asks all peoples to act and come to an agreement that allows all voices to be heard, and takes into consideration our particular situations as nations.

As President of a nation increasingly affected by the new normal, I believe the real challenge begins with an accounting of capacities: How do we ask everyone to contribute, and how do we ask those with more to help out those with less? Consider the case of the most vulnerable countries, like the developing island state of Grenada, which sustained damages that amounted to more than 200 percent of its GDP in 2004. If they lose so much, then their capacity to contribute in our efforts is also dramatically diminished. I am told that the economic costs of climate change amount to 44.9 billion dollars annually for the Vulnerable 20 (V20) countries. Inaction will cost us even more, as this number is set to grow almost tenfold by 2030, amounting to 400 billion dollars.

We are also told that, since 2010, on an annual basis, climate injustice has claimed more than 50,000 lives from V20 countries—and this number will increase exponentially in the near future. Consider further the danger faced by island-nations such as Kiribati, Tuvalu, and the Maldives, whose existence is threatened by rising water levels. Their extinction will be a certainty, unless we pursue realizable goals that acknowledge that, for some nations, the fight against climate change is a matter of survival.

In our own experience in the Philippines, we have been working to break the vicious cycle of destruction and reconstruction, where affected locales, especially our coastal communities, slide back into an impoverished state with one calamity. The primary challenge has been to move our countrymen to less vulnerable areas, on the assumption that such do exist—or to make interventions that mitigate the impacts of climate change. We are indeed hard pressed to build back better especially in the aftermath of Haiyan, and I must submit: We cannot do this in isolation.

Let me point out, however, that despite our fiscal limitations, and despite the fact that we have one of the smallest carbon footprints in the world, the Philippines continues to pursue vital reforms to address climate change; and I say that we are willing to share our experiences, knowledge, and best practices. We have a massive re-greening program. We started in 2011**; the goal is to plant 1.5 billion trees on 1.5 million hectares by next year**. Upon completion, this would translate to an absorption capacity of 30 million tons of carbon annually. To this end, the Food and Agriculture Organization of the United Nations, in its Global Forest Resources Assessment for 2015, has named our country as one of the top five nations with the greatest annual forest area gain.

We have also intensified our anti-illegal logging campaign, reducing by 88 percent the number of municipalities and cities in my country considered to be illegal logging hotspots. **We are likewise increasing the share of renewables in our energy mix, which now accounts for 33 percent of the mix.** We have put in place the policies and legislation, and allocated the funds to address climate change as far as our resources will allow. This year alone, about 5 percent of our total budget was allocated for climate change. Furthermore: Just this October, **the Philippines submitted its Intended Nationally Determined Contributions or INDC, committing our country to reducing our greenhouse gas emissions conditionally by 70 percent by 2030**. We are ready to do our part, if other nations demonstrate support in terms of finance, technology development, and capacity building.

Today, the Philippines, with the rest of the Climate Vulnerable Forum, a group that will soon grow to represent at least 1 billion people, makes our case. In the name of all our citizens, we ask you to give our proposal for more climate financing for developing countries the consideration it deserves. We likewise seek your support as the Climate Vulnerable Forum finalizes the Manila-Paris Declaration, which presents our aspirations for a world that is resilient and just, one where no one is left behind.

Excellencies, ladies and gentlemen, what our nations failed to do in Copenhagen in 2009, we must achieve here in Paris in 2015. It is time for a fair consensus to be finally reached. Our collective security depends on our ability to act. We must therefore move beyond recrimination, learn from the past, and work hand in hand to safeguard the welfare of our citizens and of the many generations to come. In this effort, no one is exempt; all must contribute.

Thank you and good day.

MEMORANDUM OF AGREEMENT

THE PUBLIC IS INFORMED:

This Memorandum of Agreement made and entered into this _____ day of _____, 2016, by and between:

The **PHILIPPINE RECLAMATION AUTHORITY** [Public Estates Authority], a government corporation created by P.D. No. 1084 as amended, with office address at the 7th & 8th Floors, Legaspi Towers 200, Paseo de Roxas, Makati City Metro Manila, represented by its General Manager and CEO **PETER ANTHONY A. ABAYA**, duly authorized for this purpose under PRA Board Resolution No. 4234, Series of 2012 (Attached as Annex "A" hereof), herein referred to as **"PRA"**;

- and -

PASAY CITY, a political unit of the Republic of the Philippines, with Office address at the City Hall Building of Pasay, represented herein by its duly elected Local Chief Executive, **MAYOR ANTONINO G. CALIXTO**, duly authorized for this purpose under Sangguniang Panlungsod Resolution No. 2874, Series of 2012 (Annex "B") herein referred to as the **"CITY"**.

ATTY. VINALYN M. POTOT-BALURAN
Notary Public
Until December 31, 2016
PTR No. 4716219; 1/04/16; Pasay City
IBP O.R. No. 867965; 1/04/16; Bilian Chapter
Commission No. 15-04, 1/29/15; Pasay City
Attorney's Roll No. 51403
MCLE Compliance No. IV-0021504-5/13/16

ANTONINO G. CALIXTO

PETER ANTHONY A. ABAYA

CERTIFIED TRUE COPY

Witness

ANTECEDENTS

Presidential Decree No. 3-A, dated January 11, 1973, mandates that all reclamation of foreshore and offshore areas shall be limited to the National Government or any person authorized by it in a proper contract;

PRA is the government agency primarily responsible for integrating and coordinating all reclamation projects and all reclamation projects shall be approved by the President of the Philippines upon the recommendation of the PRA pursuant to Presidential Decree No. 1084 as amended by Executive Order No. 525;

On June 24, 2006, Her Excellency President Gloria Macapagal-Arroyo issued Executive Order No. 543, delegating to the PRA the authority of the President to approve reclamation projects;

The **CITY**, a chartered city pursuant to Republic Act (RA) No. 183 and RA No. 7437, is authorized to undertake reclamation and development of land within its jurisdiction by dredging, filling or other means pursuant to Republic Act No. 7160 or the Local Government Code of 1991 out of the City's funds or resources, direct or otherwise;

Among the local government units in the Greater Manila area, the CITY has one of the smallest land areas, comprising of only 19 square kilometers more or less, and is in dire need for additional land area to accommodate growing demands for residential, commercial and institutional sites due to thriving population and commercial activities in the City;

The **CITY** intends to undertake a sixty (60) hectare Reclamation and Development Project ("Project") in the foreshore and submerged islands of Manila Bay fronting the Cultural Center of the Philippines (CCP) and the Financial Center Area (FCA) beginning from the Libertad Channel up to the vicinity of Gloria Maris in CCP, more particularly described hereunder, into a mixed-used, commercial, residential and tourism estate;

The **CITY** submitted to PRA the documents and paid the fees required under PRA Administrative Order (A.O.) No. 2007-2 and after review and evaluation, the documents submitted were found to be substantially complying with the requirements under the said A.O.;

The **PRA** Board approved the Project under Resolution No. 4234, series of 2012, subject to certain terms and conditions as stipulated therein;

The **CITY** has received an unsolicited proposal from SM LAND, INC. (SM), a corporation with principal office at 10/F One E-com Center, Harbor Drive, Mall of Asia Complex, Pasay City, to undertake the actual rawland reclamation and development of the Project at no cost to the **CITY**;

The **CITY** subjected the unsolicited proposal of SM Land Inc. to a competitive challenge and subsequently entered into a Contractual Joint Venture Agreement with SM LAND, INC.;

To implement the Project, there is a need for the **CITY** to enter into a Memorandum of Agreement with **PRA;**

The Office of the Government Corporate Counsel (OGCC), the statutory counsel of the **PRA,** in its Contract Review No. 163, Series of 2013, has found this MOA to be in order subject to the incorporation of its comments;

On November 13, 2013, His Excellency President Benigno S. Aquino III issued Executive Order No. 146, transferring the power to approve reclamation projects from the PRA Board to the National Economic and Development Authority (NEDA) Board;

Section 5 (a) of the Transitory Provision of EO 146 states that the EO shall apply to all reclamation projects, including those initiated by LGUs and all other government agencies/government owned or controlled corporations for which there are no contracts/agreements yet executed between the government entity concerned and a private sector proponent prior to the effectivity of this Order;

The Office of the President, through Executive Secretary Paquito N. Ochoa Jr., in a letter dated March 13, 2016, confirmed that since the 60-Hectare Pasay City Reclamation Project is covered by an implementing agreement between the City of Pasay and the concerned private party at the time EO 146 took effect, the Project is governed by Executive Order No. 543, Series of 2006, and its Implementing Rules and Regulations, and not by the subsequent EO 146.

ACCORDINGLY, for and in consideration of the foregoing premises, the parties hereto do hereby enter into this **MEMORANDUM OF AGREEMENT (MOA),** with the following terms and conditions:

ANTONINO G. CALIXTO

PETER ANTHONY A. ABAYA

Witnesses:

ATTY. VINALYN M. POTOT-BALURAN
Notary Public
Until December 31, 2016
PTR No. 4716219; 1/04/16; Pasay City
IBP O.R. No. 857965; 1/04/16; Biliran Chapter
Commission No. 15-04; 1/29/15; Pasay City

CERTIFIED TRUE COPY

ACKNOWLEDGEMENT

Republic of the Philippines)
City of PASAY CITY) S.S.

I certify that on this date before me, a notary public duly authorized in the city named above to take acknowledgments, personally appeared:

	Competent Evidence Of Identity	Place/date of issue
PETER ANTHONY A. ABAYA	Philippine Passport EC1060331	Expiry on May 11, 2019
ANTONINO G. CALIXTO	Philippine Passport Eb95708013	Expiry on Nov.12, 2018

Who are personally known to me to be the same persons described in the foregoing instrument, who acknowledged before me that the signatures on the instrument were voluntarily affixed by them for the purposes stated therein, and who declared to me that they have executed the instrument as their free and voluntary act and deed.

This instrument consisting of _____(____) pages including the page where the acknowledgement is written has been signed each and every page by the parties and their witnesses.

WITNESS MY HAND AND SEAL this _____ day of 07 JUL 2016 2016.

ATTY. VINALYN M. POTOT-BALURAN
Notary Public
Until December 31, 2016
PTR No. 4716219; 1/04/16 Pasay City
IBP O.R. No. 857965; 1/04/16; Biliran Chapter
Commission No. 15-04, 1/29/15; Pasay City
Attorney's Roll No. 54513
MCLE Compliance No. V-0021504-5/13/16

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Series of 2016.

ANTONINO G. CALIXTO

PETER ANTHONY A. ABAYA

ATTY. VINALYN M. POTOT-BALURAN
Notary Public
Until December 31, 2016
PTR No. 4716219; 1/04/16 Pasay City
IBP O.R. No. 857965; 1/04/16; Biliran Chapter
Commission No. 15-04, 1/29/15; Pasay City
Attorney's Roll No. 54513
MCLE Compliance No. V-0021504-5/13/16

ATTY. VINALYN M. POTOT-BALURAN

CERTIFIED TRUE COPY

Witnesses:

MEMORANDUM OF AGREEMENT

THE PUBLIC IS INFORMED:

This Memorandum of Agreement executed between:

The **PHILIPPINE RECLAMATION AUTHORITY** [Public Estates Authority], a government corporation created by P.D. No. 1084 as amended, with office address at the 7th & 8th Floors, Legaspi Towers 200, Paseo de Roxas, Makati City, Metro Manila and herein represented by its General Manager and CEO **PETER ANTHONY A. ABAYA**, duly authorized for this purpose under PRA Board Resolution Nos. 4643, 4655 and 4662, Series of 2016 (Attached as Annex A to A2 hereof), herein referred to as **"PRA"**.

- and -

PASAY CITY, a political unit of the Republic of the Philippines, with office address at the Pasay City Hall, F.B. Harrison St., Pasay City, represented herein by its duly elected Local Chief Executive, **MAYOR ANTONINO G. CALIXTO**, duly authorized for this purpose under Sangguniang Panlungsod Resolution No. 3109, Series of 2013 (Annex B hereof) herein referred to as the **"CITY"**.

ANTONINO G. CALIXTO

PETER ANTHONY A. ABAYA

ATTY. VINALYN M. POTOT-BALURAN
Notary Public
Until December 31, 2016
PTR No. 4716219; 1/04/16 Pasay City
IBP O.R. No. 857985; 1/04/16; Biliran Chapter
Commission No. 15-64, 1/29/15; Pasay City
Attorney's Roll No. 61643
MCLE Compliance No. V-0021504-5/13/16

CERTIFIED TRUE COPY

ANTECEDENTS

Presidential Decree No. 3-A, dated January 11, 1973, mandates that all reclamation of foreshore and offshore areas shall be limited to the National Government or any person authorized by it in a proper contract.

PRA is the government agency primarily responsible for integrating and coordinating all reclamation projects and all reclamation projects shall be approved by the President of the Philippines upon the recommendation of the PRA pursuant to Presidential Decree No. 1084 as amended by Executive Order No. 525.

On June 24, 2006, Her Excellency President Gloria Macapagal-Arroyo issued Executive Order No. 543, Series of 2006, delegating to the PRA the authority of the President to approve reclamation projects.

The **CITY**, a chartered city pursuant to Republic Act (RA) No. 183 and RA No. 437, is authorized to undertake reclamation and development of land within its jurisdiction by dredging, filling or other means pursuant to Republic Act No. 7160 or the Local Government Code of 1991 out of the City's funds or resources, direct or otherwise;

Among the local government units in the Greater Manila area, the **CITY** has one of the smallest land areas, comprising of only 19 square kilometers more or

Witnesses

less, and is in dire need for additional land area to accommodate growing demands for residential, commercial and institutional sites due to thriving population and commercial activities in the City;

The **CITY** intends to undertake a three hundred (300) hectare Reclamation and Development Project ("Project") in the foreshore and offshore areas of Pasay City fronting the Mall of Asia Complex, the CCP and the Financial Center Area beginning from the northern bank of Redemptorist Channel up towards the north in the offshore vicinity of Gloria Maris in CCP, into a mixed-used, commercial, residential, institutional centers and tourism estate;

The **CITY** submitted to PRA pertinent documents for the Project and after review and evaluation, the PRA found the **PROJECT** feasible;

On November 13, 2013, His Excellency President Benigno S. Aquino III issued Executive Order No. 146, transferring the power to approve reclamation projects from the PRA Board to the National Economic and Development Authority (NEDA) Board.

Section 5 (a) of the Transitory Provision of EO 146 states that the EO shall apply to all reclamation projects, including those initiated by LGUs and all other government agencies/government owned or controlled corporations for which there are no contracts/agreements yet executed between the government entity concerned and a private sector proponent prior to the effectivity of this Order.

The Office of the President, through Executive Secretary Paquito N. Ochoa Jr., in a letter dated March 13, 2016, confirmed that since the 300-Hectare Pasay City Reclamation Project is covered by an implementing agreement between the City of Pasay and the concerned private party at the time EO 146 took effect, the Project is governed by Executive Order No. 543, Series of 2006, and its Implementing Rules and Regulations, and not by the subsequent EO 146.

The Office of the Government Corporate Counsel, the statutory counsel of the **PRA,** in its Contract Review No. 262, Series of 2016, has found this MOA in order subject to incorporation of its comments which were incorporated hereto.

NOW THEREFORE, for and in consideration of the foregoing premises, the parties hereto do hereby enter into this Memorandum of Agreement, with the following terms and conditions:

ARTICLE I
DEFINITION OF TERMS

As used in this MOA, and in subsequent agreements complementing this MOA, unless the context indicates otherwise, the following shall be understood to mean:

a) **MOA** shall refer to this MEMORANDUM OF AGREEMENT.

b) **Cause** referred under Article VIII (Suspension and Termination of the Project) which is not attributable to the **CITY** or **PRA** shall refer to any of the following:

i. Force majeure and fortuitous event which shall be interpreted to mean an event which the **CITY** could have not foreseen, or which though foreseen, was inevitable.

ANTONINO G. CALIXTO

PETER ANTHONY A. ABAYA

ATTY. VINALYN M. POTOT-BALURAN
Notary Public
Until December 31, 2016
PTR No. 4716219; 1/04/16 Pasay City
IBP O.R. No. 857865; 1/04/16; Biñan Chapter
Commission No. 15-04; 1/29/15; Pasay City
Attorney's Roll No. 51543

CERTIFIED TRUE COPY

ACKNOWLEDGEMENT

Republic of the Philippines)
City of Ma[illegible]) S.S.

I certify that on this date before me, a notary public duly authorized in the city named above to take acknowledgments, personally appeared:

	Competent Evidence of Identity
PETER ANTHONY A. ABAYA	Philippine Passport No. XX4688777 Expiry Date : May 11, 2019 Issued at : DFA Manila
ANTONINO G. CALIXTO	Philippine Passport EB95708013 Expiry Date : Nov.12, 2018

ATTY. VINALYN M. POTOT-BALURAN
Notary Public
Until December 31, 2016
PTR No. 4716219; 1/04/16 Pasay City
IBP O.R. No. 857965; 1/04/16; Ellean Chapter
Commission No. 15-04, 1/29/15; Pasay City
Attorney's Roll No. [illegible]
MCLE Compliance No. V-0002154-5/13/16

Who are personally known to me to be the same persons described in the foregoing instrument, who acknowledged before me that the signatures on the instrument were voluntarily affixed by them for the purposes stated therein, and who declared to me that they have executed the instrument as their free and voluntary act and deed.

CERTIFIED TRUE COPY

This instrument consisting of _____ (____) pages including the page where the acknowledgement is written has been signed each and every page by the parties and their witnesses.

WITNESS MY HAND AND SEAL this _____ day of 17 JUN 2016 2016.

Doc. No. 425;
Page No. 86;
Book No. 60;
Series of 2016.

ATTY. VINALYN M. POTOT-BALURAN
Notary Public
Until December 31, 2016
PTR No. 4716219; 1/04/16 Pasay City
IBP O.R. No. 857965; 1/04/16; Ellean Chapter
Commission No. 15-04, 1/29/15; Pasay City
Attorney's Roll No. 51613
MCLE Compliance No. V-0002154-5/13/16

Republika ng Pilipinas
LUNGSOD NG PASAY, KALAKHANG MAYNILA

PUBLIC SCOPING REPORT
Proposed 60 Hectares and 300 Hectares Reclamation Project
To be located along the Coast of Manila Bay, City of Pasay

1.0 Date and Venue / Objectives

The Public Scoping for the above-caption Project was conducted on 09 July 2014 at Meeting Room 2 Secretariat Hall Philippine International Convention Center (PICC) Vicente Sotto, Pasay City.

Following are the objectives of the Public Scoping:

- To define the range of actions, alternatives and impacts for / of a project that should be examined in an Environmental Assessment Report.
- To provide an early link between the DENR and the proponent, and more importantly with the affected communities, so as to ensure that the EIA addresses relevant issues and presents results in a form consistent with the regulatory review requirements.
- To allow interested parties (e.g. stakeholders) to make their concerns known and to help ensure that EIA study proper actually addresses issues and potential impacts of concern to all parties.

2.0 Basis for selection of Participants

- The stakeholders located in the Impact Areas as defined in the EIS System were invited to participate. Among those invited were stakeholders in the Direct and Indirect Impact Areas, LGUs, Non-Government Organizations (NGO) / People's Organization (PO), Sofitel Hotel, Cultural Center of the Philippines, the Government Service Insurance System, Coconut Palace, PEMSEA, the EMB Central Office and NCR, and others

3.0 Basis for Selection of the Venue.

Several options were evaluated for a venue including the Pasay City Hall, restaurants, and hotels in Pasay City but the final choice of the PICC was based on the following:

- Within the Impact Zone of the Project
- Within the political jurisdiction of the project site
- Accessibility to participants
- Assurance of reliable power (electricity)
- Size of meeting room
- Availability

The Pasay City Hall was also seriously considered but PICC was a more appropriate choice given the above criteria. The size of the meeting room and availability did not favor Pasay City Hall. Furthermore, holding a meeting at the Project Proponent's premises may open to likely questions from certain stakeholders.

4.0 Invitations

Formal written invitations were issued two (2) weeks before the scheduled date. A sample invitation letter duly received is attached in Annex 1. Moreover, all invitation letters were sent personally and also via mail through courier service. Invitations sent were duly acknowledged, received and forwarded to the person concerned. Shown in Annex 2 are copies of the acknowledgement of receipts of the invitations.

The Master List of Invitations sent is attached in Annex 3 where 68 offices and sectors were invited.

5.0 The Public Scoping started at 09:00 a.m. on 09 July 2014 with registration of participants started at 08:30 a.m. The attendance sheets are given in Annex 4 showing one hundred (100) participants.

6.0 The session was moderated by the EIA Preparer Member through Ms. Nadia Perez Conde. The Project Rationale was discussed by the Proponent through Atty. Severo C. Madrona Jr. –Legal Officer of City of Pasay while the Environmental Impact discussion was presented by Edgardo G. Alabastro Ph.D. Shown in Annex 5 is the copy of the power point presentation.

7.0 The presentation was followed by an open Question and Answer session recorded in a Summary Matrix Format in Annex 6 and handwritten questions with signature are provided in Annex 7.

8.0 Photographs of the Public Scoping are shown in Annex 8.

9.0 Annexes

1. Sample invitation letter
2. Sample invitation letter duly received
3. Master List of invitation sent
4. Attendance sheets
5. PowerPoint Presentation
6. Summary Matrix Format of List of Issues
7. Handwritten Questions with Signature
8. Photographs of the Public Scoping

ANNEX 1

technotrîx consultancy servîces, înc. Lungsod ng Pasay

10 June 2014

ATTY. MICHAEL DRAKE MATIAS
Chief, EIAMD
DENR -EMB Central Office
Diliman, Quezon City

Dear **Atty. Matias:**

In our capacity as the Environmental Impact Assessment (EIA) Preparer and under authority from the **PASAY CITY GOVERNMENT**, the Project Proponent, we wish to cordially invite you again to the **Public Scoping** for:

PROPOSED 60 HECTARES and 300 HECTARES RECLAMATION PROJECT
To be located along the coast of Manila Bay, City of Pasay

on the following date, time and place:

Date : **09 July 2014**
Time : **8:30 a.m. (start of registration); 9:00 a.m. (program proper)**
Place : Meeting Room 2Secretariat Hall Philippine International Convention Center (PICC) Vicente Sotto, Pasay City

As provided in DENR Department Administrative Order No. 2003 – 30 as amended, this Public Scoping will be conducted to define the range of actions, alternatives and impacts for / of a Project that are to be examined in an Environmental Assessment Report. It is a formal step governed by guidelines and requiring documentation of outcomes under the regulatory system of Environmental Impact Assessment (EIA). Scoping provides an early link between the DENR and the proponent, and more importantly with the affected communities, so as to ensure that the EIA addresses relevant issues and presents results in a form consistent with the regulatory review requirements.

You may note that the Public Scoping for the 60 hectares has been undertaken last February 20, 2013. However, with the proposed addition of another 300 hectares, another Public Scoping is required by the EIS system.

Attached is the proposed Program for your reference.

Should you have any questions, please contact the following:
- EIA Consultant: **Dr. Edgardo G. Alabastro** (+63)917.825-5203
- Proponent : **Atty. Severo C. Madrona**, City Legal Officer (02)833-3729

We hope you and/or your authorized representative can attend this important meeting.

Thank you.

Sincerely,

EDGARDO G. ALABASTRO, Ph.D.
Chief Executive Officer
Technotrix Consultancy Services, Inc.

Noted by:

HON. MAYOR ANTONINO G. CALIXTO
City Mayor
Pasay City

ANNEX 2

technotrix consultancy services, inc.

Lungsod ng Pasay

10 June 2014

ENVIRONMENTAL MANAGEMENT BUREAU
REGION EIGHTEEN / CENTRAL OFFICE
JUN 16 2014
RECEIVED

ATTY. MICHAEL DRAKE MATIAS
Chief, EIAMD
DENR -EMB Central Office
Diliman, Quezon City

Dear **Atty. Matias:**

In our capacity as the Environmental Impact Assessment (EIA) Preparer and under authority from the **PASAY CITY GOVERNMENT**, the Project Proponent, we wish to cordially invite you again to the **Public Scoping** for:

PROPOSED 60 HECTARES and 300 HECTARES RECLAMATION PROJECT
To be located along the coast of Manila Bay, City of Pasay

on the following date, time and place:

Date : **09 July 2014, (Wednesday)**
Time : **8:30 a.m. (start of registration); 9:00 a.m. (program proper)**
Place : Meeting Room 2Secretariat Hall Philippine International Convention Center (PICC)
Vicente Sotto, Pasay City

As provided in DENR Department Administrative Order No. 2003 - 30 as amended, this Public Scoping will be conducted to define the range of actions, alternatives and impacts for / of a Project that are to be examined in an Environmental Assessment Report. It is a formal step governed by guidelines and requiring documentation of outcomes under the regulatory system of Environmental Impact Assessment (EIA). Scoping provides an early link between the DENR and the proponent, and more importantly with the affected communities, so as to ensure that the EIA addresses relevant issues and presents results in a form consistent with the regulatory review requirements.

You may note that the Public Scoping for the 60 hectares has been undertaken last February 20, 2013. However, with the proposed addition of another 300 hectares, another Public Scoping is required by the EIS system.

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- Proponent : **Atty. Severo C. Madrona**, City Legal Officer (02)833-3729

We hope you and/or your authorized representative can attend this important meeting.

Thank you.

Sincerely,

EDGARDO G. ALABASTRO, Ph.D.
Chief Executive Officer
Technotrix Consultancy Services, Inc.

Noted by:

HON. MAYOR ANTONINO G. CALIXTO
City Mayor
Pasay City

ANNEX 3

Name	Address	Organization	Status of Invitation Sent	Status of Confirmation
Hon. Vice President Jejomar Binay	Office of the Vice President Coconut Palace CCP Complex Pasay City	Government of the Philippines	Invitation Sent to office personally	No confirmation
Hon. Marlon A. Pesebre	Pasay City Hall Building F.B. Harrison, Pasay City	Pasay City Government	Invitation Sent to office personally	No confirmation
Engr. Merlita L. Lagmay	Pasay City Hall Building F.B. Harrison, Pasay City	Pasay City Government	Invitation Sent to office personally	No confirmation
Engr. Edwin Y. Javaluyas	Pasay City Hall Building F.B. Harrison, Pasay City	Pasay City Government	Invitation Sent to office personally	No confirmation
Dr. Cesar F. Encinares	Pasay City Hall Building F.B. Harrison, Pasay City	Pasay City Government	Invitation Sent to office personally	No confirmation
City Councils Office	Pasay City Hall Building F.B. Harrison, Pasay City	Pasay City Government	Invitation Sent to office personally	Will attend
Rose San Miguel	Brgy. 76 Zone 10 Pasay City	Pasay City Government	Invitation Sent via courier	No confirmation
Teresa Salanguit	Manila Bay Coordinating Office Nursery Compound, North Avenue, Diliman, Quezon City	Manila Bay Coordinating Office	Invitation Sent to office personally	No confirmation
Lourdes C. Wagan	National Ecology Center, East Avenue, Quezon City	DENR-NCR	Invitation Sent to office personally	No confirmation
Vizminda A Osorio	DENR-EMB NCR	DENR-NCR	Invitation Sent to office personally	No confirmation
Peter Anthony A. Abaya	7th Floor, Legaspi Towers 200 Bldg, 107 Paseo de Roxas Street, Legaspi Village	Philippine Reclamation Authotiry	Invitation Sent to office personally	No confirmation
Pasay City Traffic and Management Bureau	F.B. Harrison, Pasay City	Pasay City Government	Invitation Sent to office personally	No confirmation
Atty. Michael Matias	DENR -EMB Central Office	DENR-EMB Central	Invitation Sent to office personally	No confirmation
School Division Superintendent	Divisions of City Schools, Pasay Zamora St., Pasay City	Division of City Schools, Pasay	Invitation Sent to office personally	No confirmation
Manila Yatch Club	2351 Roxas Boulevard, Manila	Manila Yatch Club	Invitation Sent to office personally	No confirmation

Sofitel Manila	Atang Dela Rama, Pasay City 1300	Sofitel Manila	Invitation Sent to office personally and through email	Will attend
Government Services Insurance System	Pasay City	Government Services Insurance System	Invitation Sent to office personally	No confirmation
Atty. Juan C. Sta. Ana	Bonifacio Drive, South Harbor	Philippine Ports Authority	Invitation Sent to office personally	No confirmation
Vice Admiral Jesus C. Millan	Naval Station Jose V Andrada #2335 Roxas Boulevard, Manila	Philippine Navy	Invitation Sent to office personally	No confirmation
Mr. Raul M. Sunico, Ph.D	CCP Complex, Roxas Boulevard, Pasay City, Metro Manila, Philippines	Cultural Center of the Philippines	Invitation Sent to office personally	No confirmation
Mr. Adrian Ross	DENR Compound, Diliman Quezon City	Partnership in Environmental Management of the Seas of East Asia (PEMSEA)	Invitation Sent to office personally	Will attend
Secretary Ramon Jimenez Jr.	DOT Building, Agrifina Circle, Rizal Park	Department of Tourism	Invitation Sent via courier	No confirmation
Liga Ng Mga Barangay	4th Floor Pasay City Hall Building F.B. Harrison, Pasay City	Liga ng mga Barangay Paay City	Invitation Sent to office personally	No confirmation
ABC President	Pasay City	ABC	Invitation Sent to office personally	No confirmation
Mrs. Adelaida Paciente	No.61 Emma St. Pasay City	Emma Homeowners Association Inc.	Invitation Sent via courier	No confirmation
Engr. Rolando Londonio	Rm. 426 4th F Pasay City Hall Pasay City	Prime Movers Multi Purpose Cooperative	Invitation Sent to office personally	No confirmation
Mr. Samuel Enesando	2442 Torres Bldg. Park Ave. Pasay City	Pasay City Network for the Protection of Children	Invitation Sent via courier	No confirmation
Rev. Fr. Socrates Montealto	2130 F.B. Harrison St. Pasay City	Our Lady of Sorrows Outreach Foundation	Invitation Sent to office personally	No confirmation
Mr. Alfredo Francisco	181 P. Santos St. Malibay Pasay City	Peace and Order Force Multiplier	Invitation Sent via courier	Will attend
Mr. Edgardo M. Rubiano	167 San Juan St. Malibay Pasay City	Eduardo "DUAY" Calixto Foundation Inc.	Invitation Sent to office personally	No confirmation
Ms. Cristina Avila	Block 23 Snt.Peter St. Maricaban Pasay City	Maricaban Market Vendors Association Inc.	Invitation Sent via courier	No confirmation
Ms. Fe Amador	No.16 Sun Valley Drive NAIA, Pasay City	Sun Valley NAIA Stall Owner & Vendors Association Inc.	Invitation Sent via courier	No confirmation
Ms. Teresita Ligtas	No.741 Vitales St. Malibay Pasay City	E.Cornejo Vitalez Residents Association Inc.	Invitation Sent to office personally	No confirmation
Ms. Armida Cerdeña	282 M. Geronimo St.	Geronimo	Invitation Sent via	Will attend

	Malibay Pasay City	Homeowners Association Inc.	courier	
Ms. Vilma B. Penos	842 A I. Santos St. Malibay Pasay City	Family Touch Malibay Association Inc.	Invitation Sent via courier	No confirmation
Sandra M. Camesa	53 Cementina St. Pasay City	SPECS Foundation Inc.	Invitation Sent to office personally	No confirmation
Sr.Nida Viovicente	162 Sinsiego St.F.B.Harrison St. Pasay City	SERRAS Center for Girls	Invitation Sent via courier	No confirmation
Ma.Victoria C. Yulo	2503 Taft Ave. cor. Escobal St. Pasay City	Pangarap Foundation	Invitation Sent to office personally	No confirmation
Ms. Gemma G. Cruz-Araneta	G/F Museo Pambata Building, Roxas Boulevard, Ermita Manila, Philippines	Heritage Conservation Society (HCS)	Invitation Sent via courier	No confirmation
Rev. Fr. Benito Tuazon	Caritas Manila Compound 2002 Jesus St., Pandacan, Manila	Ministry on Ecology and Commission on Social Services and Development The Roman Catholic Archdiocese of Manila	Invitation Sent to office personally	No confirmation
Dr. Renato Solidum	PHIVOLCS Building, C.P. Garcia Avenue, U.P. Campus, Diliman Quezon City, Philippines	Philippine Institute of Volcanology and Seismology (PHIVOLCS)	Invitation Sent to office personally	No confirmation
Mr. Nereus Acosta	4/F Annex Bldg., Sugar Regulatory Administration (SRA) Compound North Ave., Diliman, Quezon City	Laguna Lake Development Authority (LLDA)	Invitation Sent to office personally	No confirmation
Mr. Lory Tan	4th Floor JBD Plaza #65 Mindanao Avenue Barangay Bagong Pag-asa, Quezon City 1105 Philippines	World Wildlife Fund (WWF)	Invitation Sent to office personally and through email	No confirmation
The United Architects of the Philippines	UAP Building, 53 Scout Rallos Street, Barangay Laging Handa Diliman 1103 Quezon City, Philippines	United Architects of the Philippines	Invitation Sent to office personally	Will attend
Director Mundita Lim	Ninoy Aquino Parks and Wildlife Center Diliman, 1100 Quezon City Philippines	Protected Area and Wildlife Bureau (PAWB)	Invitation Sent to office personally	Will attend
Atty. Francis Tolentino	MMDA Bldg., EDSA cor. Orense St., Guadalupe, Makati City	Metro Manila Development Authority (MMDA)	Invitation Sent to office personally	No confirmation
Architect Jun Palafox	11th Floor 6782 Ayala Avenue, Makati	Palafox & Associates	Invitation Sent to office personally	No confirmation
Hon. Arsenio M.	6/F, NEDA Building,	National Economic	Invitation Sent via	No

Balisacan	Ortigas Center, Pasig City	and Development Authority (NEDA)	courier	confirmation
Mr. Henry T. Sy, Jr.	One E-com Center, 10th Floor Harbor Drive Mall of Asia Complex, CBP-IA Pasay City 1300, Philippines	SM Land Inc. (SMLI)	Invitation Sent via courier	No confirmation
Honourable Mayor Joseph Ejercito Estrada	Manila City Hall, Arroceros, Manila	Manila City Government	Invitation Sent to office personally	No confirmation
Honourable Francisco " Isko Moreno" Domagoso	Manila City Hall, Arroceros, Manila	Manila City Government	Invitation Sent to office personally	No confirmation
Manila City Council	4thFloor Manila City Hall, Arroceros, Manila	Manila City Government	Invitation Sent to office personally	No confirmation
Engr. Roberto R. Bernardo, CESO IV	3rd Floor Manila City Hall, Arroceros, Manila	Manila City Government	Invitation Sent to office personally	No confirmation
Arch. Danilo H. Lacuna, Jr.	3rd Floor Manila City Hall, Arroceros, Manila	Manila City Government	Invitation Sent to office personally	No confirmation
Mr. Carter Don Y. Logica	3rd Floor Manila City Hall, Arroceros, Manila	Manila City Government	Invitation Sent to office personally	No confirmation
Mayor Vergel "Nene" Aguilar	Alabang Zapote Road, Pamplona Tres Las Piñas City	Las Piñas City Government	Invitation Sent to office personally	No confirmation
Vice Mayor Luis I. Bustamante	Alabang Zapote Road, Pamplona Tres Las Piñas City	Las Piñas City Government	Invitation Sent to office personally	No confirmation
City Councils Office	Alabang Zapote Road, Pamplona Tres Las Piñas City	Las Piñas City Government	Invitation Sent to office personally	Will attend
Engr. Rosabella Bantog	Alabang Zapote Road, Pamplona Tres Las Piñas City	Las Piñas City Government	Invitation Sent to office personally	No confirmation
Engr. Leonida Lagrisola	Alabang Zapote Road, Pamplona Tres Las Piñas City	Las Piñas City Government	Invitation Sent to office personally	No confirmation
Capt. Albert Arevalo	J. Aguilar Ave., Pamplona Tres Las Piñas City	Las Piñas City Government	Invitation Sent to office personally	Will attend
Mayor Edwin L. Olivarez	San Antonio Valley 1 Parañaque City	Parañaque City Government	Invitation Sent to office personally	No confirmation
Vice Mayor Rico T. Golez	San Antonio Valley 1 Parañaque City	Parañaque City Government	Invitation Sent to office personally	No confirmation
City Councils Office	San Antonio Valley 1 Parañaque City	Parañaque City Government	Invitation Sent to office personally	No confirmation
Engr. Benigno I.	San Antonio Valley 1	Parañaque City	Invitation Sent to	Will attend

Rivera	Parañaque City	Government	office personally	
Engr. Aser S. Mallari	San Antonio Valley 1 Parañaque City	Parañaque City Government	Invitation Sent to office personally	No confirmation
Mr. Teodorico S. Barandino	San Antonio Valley 1 Parañaque City	Parañaque City Government	Invitation Sent to office personally	No confirmation

ANNEX 4

On

PUBLIC SCOPING
PROPOSED 60 HECTARES and 300 HECTARES RECLAMATION PROJECT
09 July 2014, Wednesday, Meeting Room 2 Secretariat Hall Philippine International Convention Center (PICC) Vicente Sotto, Pasay City

NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
FERDINAND I GUTIERREZ	SAN ROQUE (FMHC)	09164272407	NO TO RECLAMATION	
REYNALDO O. SAN JUAN	EN ROQUE (FMHC)	09324348884	NO TO RECLAMATION	
SEVELI R. PALIC	San Roque (FMHC)	824-09-55	NO TO RECLAMATION	
B-o Robert Francis A Belleza	San Roque	0906-4066691	No to Reclamation	
Carmencita Macaraeg	Our Lady of Fatima	854-7450	No to Reclamation	
MINERVA P. DANGARAN NO TO RECLAMATION	Our Lady of Fatima de Pasay	854-7450	—	
Elmina Aldeguer	PSSDM Coordinator OLFPD	09995230222	No to Reclamation	
Carmelita D. Libao	Our Lady of Fatima	09293513107	no to Reclamation	
PACIFICA M. LLIGAN	Our Lady of Fatima	833-8252	no to Reclamation	
ANTONIO B. ESCAÑOLA	Lay Minister	09175329737		
SOCRATES MONTEMAYOR	Our Lady of Sorrow	09167015200		
NELSON LPK	" " "	09247[illegible]		
Loreto Saturnino	RCAM / Sta. Clara	846-0453		
Ellen Rutin	PPC / San Juan Mega	211-2150	No to Reclamation	
Lon Asenio	ROAM Gallery	NO TO	RECLAMATION	

Private

PUBLIC SCOPING
PROPOSED 60 HECTARES and 300 HECTARES RECLAMATION PROJECT
09 July 2014, Wednesday, Meeting Room 2 Secretariat Hall Philippine International Convention Center (PICC) Vicente Sotto, Pasay City

NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
JOEL ZURBANO	MLA STAFF (PASAY)	09106720179		
KENG ESTRELLA	PASAY CITY CITIZENS LEAGUE FOR GOOD GOVT.	09064137457		
EDWARDSON L. ONG	COUNSEL - SOFITEL	09175297523	elong@pecalaw.ph	
ANDY MARTINEZ	SOFITEL	09173092105	andy.martinez@sofitel.com	
LINA SOLIS	SOFITEL	09173092103	Lina.solis@sofitel.com	
Amor Villegas	LODOR / DWAO	09052943966		
Godson Escopete		09178954782		
ANABEL SAN JUAN		09081375064		
Paul Villegas		09263315346		
NOKO DELA PAZ		09299591985		
Arya	NUJP	09283889569		
Felix Tambugco	DZRJ Am	09182079507		
MARK RICHARD LINAYAO		09239208946		
Sonny		09209572581		

NSO's

PUBLIC SCOPING
PROPOSED 60 HECTARES and 300 HECTARES RECLAMATION PROJECT
09 July 2014, Wednesday, Meeting Room 2 Secretariat Hall Philippine International Convention Center (PICC) Vicente Sotto, Pasay City

NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
JAMES C. SALAS	MALIBAY CRUSADERS FOR COMMON GOOD-MCCG	09062227503		
MA. CRISTINA AVILA	MARI CABAN VENDORS ASSN. INC.	09185243940		
JOSEPH CARAMES	ASAP	09178222703	jomen_58@yahoo	NO TO RECLAMATION
MABEL MARIE R. BALBA	ASAP	09157104038		NO TO RECLAMATION
Fe Amador	SUNSOVAI	09213689736	Wades Marie	
Jude D. Amador	"	09308413[illegible]		
Evelyn Mangon	SUNSOVAI	09095[illegible]	"	
Gina D Malinao	SUNSOVAI	09499209049	"	
Mary Rocano	SUNSOVAI	09998609263	"	
[illegible]	SUNSOVAI	09[illegible]8091601	"	
Quirino Salcedo			"	
Willy Querubin				
R. Acutilla				
CESAR MACABAG	SAVE PEOPLES ISLAND MOVEMENT	09189370401	savepeoplesisland@yahoo.com	

PUBLIC SCOPING
PROPOSED 60 HECTARES and 300 HECTARES RECLAMATION PROJECT
09 July 2014, Wednesday, Meeting Room 2 Secretariat Hall Philippine International Convention Center (PICC) Vicente Sotto, Pasay City

NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
Annie Cerdeña	Geronimo Ad	8342917	annecerdena@gm	
Lilia G. Arg	Tengco Kat. PC	09099958708		
Richard Jave	Pangco	09276932nn	javerichard120@gmail	
~~BETH~~ FREDDIE				
NOEL S-SANCHEZ				
CORA GUIDOTE	SMIC	09175245794		
THERESE NECIO	SMPRIME			
BETH SANCHEZ				
~~ANTONIO [illegible]~~	~~[illegible]~~	~~[illegible]~~		

PUBLIC SCOPING
PROPOSED 60 HECTARES and 300 HECTARES RECLAMATION PROJECT
09 July 2014, Wednesday, Meeting Room 2 Secretariat Hall Philippine International Convention Center (PICC) Vicente Sotto, Pasay City

NAME	AFFILIATION/OFFICE	CONTACT NUMBERS	EMAIL ADDRESS	SIGNATURE
Rose Simpson	Con Juan Reyes Mo	0917-5209544	NO to Reclamation	
Bro. Remy Ochoa	SJN	0917 3935917	NO.	
S/Bernadette Eugenio	Assumption	8571638	bernadetteeugenio@yahoo.com	

ANNEX 5

PROJECT DESCRIPTION REPORT (PDR)

1.0 BASIC PROJECT INFORMATION

Table PD 1. Basic Project Information

ITEM	Project Information
Name of Project	Proposed 60 Hectares and 300 Hectares Reclamation Project
Location	Along the Coast of Manila Bay, City of Pasay
Nature of Project	**ECP in an ECA (**Presidential Proclamation 2146 dated 14 December 1981)
Classification	**D.1. Major Reclamation Project ≥ 50 hectares**
Size/Scale	60 Hectares and 300 Hectares, more or less
Status of ECC	Being Applied For

Table PD 2. Profile of Proponent/EIA Preparer

ITEM	Project Information
Project Proponent	City of Pasay
Contact Address	Pasay City Hall
Telephone Numbers	(02) 833-3729
Responsible Officer	**Atty. Severo Madrona**
EIA Preparer	Technotrix Consultancy Services, Inc.
Contact Person	**Edgardo G. Alabastro, Ph.D.**
Address	Unit 305 FMSG Building, Balete Dr. QC 1101
Contact Numbers	Tels. 02 416 4625 Mobile 0917 8877695
Email address	technotrixinc@gmail.com

**The City of Pasay will be contracting out the implementation of the Project to a Third Party Entity in which case the Proponent for the ECC will be this Third-Party Project Developer*

2.0 PROJECT DESCRIPTION

2.1. Project Area and Location

The Project will occupy a total land area of approximately 60 hectares and 300 hectares.

Location and Political Boundaries

The project site is within the waters of the Manila Bay along the Along the Coast of Manila Bay, City of Pasay.

The location is shown in a NAMRIA map given in Figure PD.1 page PD-2 while an aerial satellite map is provided in Figure PD.2 page PD-3.

Authority of Proponent Over Project Site

Under current regulations of the NEDA which has been recently given the mandate to take administrative supervision of the Philippine Reclamation Authority (PRA), an Environmental Compliance Certificate (ECC) is a prequisite to making a formal Agreement with the Project Proponent (City of Pasay) for authority to develop the reclamation project.



Figure PD 1. Location of Site in a NAMRIA Map



Figure PD 2. Satellite Map of the Project Site



Figure PD 3. The Political Boundaries of the Cities of Manila and Pasay in relation to the Project Site

2.2 Project Rationale

The proposed project is consistent with and in support of the Philippine government's (through the Philippine Reclamation Authority) vision to develop reclamation projects.

In particular, it is in support of the PRA's Master Plan for the Manila Bay Sector (MBS).

The project will also serve to:

- Promote further the well-being of the people of the City of Pasay especially in terms of employment and livelihood;
- Stimulate city growth by providing a basic infrastructure - land to investors;
- Help solve congestion problems
- Actualize vision of government through the PRA
- Actualize the visions of Boulevard 2000

On a national context,

The project will demonstrate that by itself and together with other existing and proposed reclamation projects in Manila Bay a sound harmony between environment and progress can be achieved as has been in other neighboring countries, principally Singapore, which propelled its growth through this type of undertaking.

2.3 Project Components

The Preliminary Conceptual Master Development Plan is shown in Figure PD.3.

- Horizontal Development Only-**1ST Phase**
- Adequate water circulation/200-meter buffer
- Effective management of the fill materials
- Proper drainage system
- External and Internal access road networks
- Pollution Abatement Facilities



Figure PD 3. Preliminary Conceptual Master Development Plan

2.4 Project Phases, Key Environmental Aspects, Wastes, Issues, Built-in Measures

2.4.1 Description of Project Phases

2.4.1.1 Pre-Construction/Pre-Development Phase

The only activities at the project site are survey works and no major environmental aspects are involved.

Design and Engineering works

2.4.1.2 Construction/Reclamation Phase

The major activities involved are:

Clean up of the reclamation area with scraps, metals, plastics and debris
Compartmentalization of the reclamation areas into activity areas or phases
Installation of containment structures
Dredging
Disposal of unwanted dredged materials
Travel of dredging vessel to site of fill materials
Return of vessel to reclamation site
Filling of site on phased basis
Draining of water from intertices of reclamation
Stabilization and Condition of reclaimed land

2.4.1.3 Operations Phase (Not included in the scope of this EIS)

This involves the development of the reclaimed area in accordance with the master plan; construction/installation of

Road Network
Water/Electricity/Communications Distribution System
Construction of buildings and structures
Operation of the Locators and of customers/guests/visitors

2.4.1.4 Decommissioning

A decommissioning scenario may be that brought about by force majeuire

2.4.2 Project Phases and Key Environmental Aspects. These are summarized in Table PD.3

Table PD 3. Project Phases and Key Environmental Aspects

Key Environmental Aspects	Wastes	Issues	Built-in Measures
Pre-Construction	Nil	Nil	N.A.
Construction Phase			
Water/Marine Clean up of Sea Bed	Debris, scraps, plastics, etc.	Dumping into other portions of sea	Dispose on shore
Dredging	Silt	Turbidity Dispersal to other portions of sea	Silt curtains Channels
Movement of Dredge Vessel	Oil	Marine pollution	On board oil containment and recovery system
Soil stabilization	Construction scraps and debris Super plasticizer wastes	Accidental dumping to the Bay Bay pollution	Scrap/debris collector systems Collection and disposal on shore
Operations Phase			
Locators' Operation	Waste Water	Bay Pollution	WWTP
	Garbage Scraps (light bulbs, etc)	Bay Pollution Accidental dumping to the Bay	Collection and Disposal System Collection and Disposal System

2.5 Initial Environmental Impacts and Management Plan (IMP)

The wastes generation, potential impacts including pollution and mitigating measures are included in Table PD-4.

Table PD 4. Initial Summary Matrix of the IMP

Item	Resource	Impacts	Mitigating Plans
Construction Phase			
1	Land	Minor impact on traffic from construction vehicles Perceived flooding	Traffic control and scheduling of construction vehicle movements No disturbance of drainage system Project can mitigate vs. storm surges
2	Water (Manila Bay)	Domestic waste discharges Loss of Water Body	Built in toilet facilities No direct Discharges to Manila Bay Comply with reclamation boundaries Creation of water body from dredging of

			fill materials in other portions of the Bay
		Change in morphology	Negligible due to small reclamation area compared to area of Manila Bay
		Water Quality Turbidity	Filling Materials to be free from undesirable substances Short term only; construction methodology, e.g. breakwater/bulkheads
		Marine Species Restriction of access to fishing area	Estimated initially to be minimal due to existing low population at the impact zone Nil based on initial assessment of absence of major fishing activities
3	Air & Climate Change	Noise (disturbance to fishes)	Minimize use of heavy equipment Scheduling of operations of heavy equipment
		Emissions	From temporary use of electric power generators
4	People	Employment generation	Priority to host community
Operations Phase			
5	Land	Potential Flooding Land Use Plan Traffic Congestion	No blockage of drainage systems Dissipation of storm surge Circulation of water Existence of complementary Flood control projects in the area Increase in land resources Traffic Management (with local enforcers)
6	Water	Marine Domestic Waste Discharges Water Resource competition	Irreversible loss of portion of M. Bay No significant marine species to be impacted Use and maintenance of Toilet Facilities None
7	Air	Minimal/Short term Emission and Noise from equipment	Well-maintained construction equipment
8	People	Socio economic benefits	Benefits from SDP; Employment and livelihood opportunities; Economic gains; social development
9		Climate Change Risks and Hazards	No major ghg's from Project Engineering Interventions through Design and Construction /Reclamation Methodologies

2.6 Key Stakeholders/Community Concerns

These are basically perceived risks and hazards:

Alleged Flooding

Storm Surges

Liquefaction and Seismic-related scenarios

3. ANNEXES

3.1 Collage of Photographs

3.2 Map of the Project Site Vicinity

Annex 3.1 COLLAGE OF PHOTOGRAPHS



Seawall Along the Adjacent Coconut Palace



Seawall Along the Adjacent Sofitel Hotel



Photograph Showing the General Features of the Immediate Vicinity of the Project Site



Map of the Project Vicinity

4.0 Estimated Timetable

An initially estimated timetable of 2 – 3 years may be expected.

5.0 Estimated Cost

The project cost may reach Php 30-40 Billion

ANNEX 6

Project Name	**Proposed 60 Hectares and 300 Hectares Reclamation Project.**	Project Location	Barangay: **Along the coast of Manila Bay** Municipality/City: **Pasay City** Province: Region:
Proponent Name	**Pasay City Government**	Proponent Address	**Pasay City Hall –FB Harrison St., Pasay City**
Proponent Contact Person	**Atty. Severo Madrona, Jr.**	Proponent Means of Contact	Landline No : **(02) 833-3729** Fax No. : Mobile No : Email :
EIA Consultant	**Technotrix Consultancy Services, Inc.**	Consultant Address	**Suite 305 FMSG Building #9 Balete Drive, New Manila Quezon City**
EIA Consultant Contact Person	**E.G. Alabastro, Ph.D.**	Consultant Means of Contact	Landline No **:02-4164625** Fax No. **: 02-4164625** Mobile No **:0917.8255203** Email **: technotrixinc@gmail.com**
EMB/DENR Scoping Representatives	**EMB- NCR: Eng. Gil F. Ferareza**	Place of Public Scoping	**Meeting Room 2 Secretariat Hall Philippine International Convention Center, (PICC) Vicente Sotto, Pasay City**
		Date of Public Scoping	**09 July 2014**

ISSUES / CONCERNS TO BE INCLUDED IN THE SCOPE OF THE EIA STUDY

EIA Module	Issues/Suggestions Raised by Stakeholder	Sector or Representative Who Raised the Issue/ Suggestion	Proponent's Response
Procedural Matters	Postponement of Public Scoping Per Letter of received July 7, 2014 Letter to Pasay dated July 4, 2014 attached		Public Scoping explained Public Consultations will be held (Letter of Pasay dated July 7, 2014 attached)
	EMB should conduct this Public Scoping together with the Review committee not the Proponent. Procedure of EIS Process not following according to law. Public Consultation was not done for the Proposed Project unlike Paranaque	**Lou Arsenio- RCAM Ecology**	In accordance with the Procedural Manual for the PEISS Public Scoping is proponent driven together with their consultant. The Review Committee will be selected by the EMB after receipt from Proponent/Consultant of the results of the Public Scoping and of the Project Description, thus not present. The same process is observed for all other projects.

	Venue of Public Scoping- Why conduct in PICC the Public Consultation not Pasay City Hall or conduct in the impact area	**Rogelio Weng Estrella -Pasay City Citizens League for Local Government**	It was reiterated that the meeting with the stakeholders is not a Public Consultation, but a Public Scoping. Compliance was made to the requirement/guidelines of EMB, to conduct Public Scoping near the project site and within the impact area. Several other venues were considered including the Pasay City Hall but the PICC was most suitable and also available. Moreover PICC is also in a reclamation site though this is not a basis for choice of venue.
	EMB should answer that Public Scoping is proponent Driven to be clarified by the process	**Grace Makabale –Save Freedom Island Movement**	It was reiterated that Public Scoping is proponent driven. The EIA document will be reviewed by Central Office. Engr. Gil Ferareza is here from EMB NCR as an observer. He attests to the Central Office his findings if the Procedural Manual has been complied him.
	ECCs for Manila, Pasay and Paranaque are piecemeal. Programmatic ECC is suggested. What is the impact of the proposed project to the effect of ecosystem as a whole because we should look at all the aspects? There should be programmatic and not a single project approach The Supreme Court "Mandamus" should be observed	**Mr. Robert Rara, PEMSEA**	The Proponents for each project are different; thus one ECC for all projects neither practical nor legally correct, because each Proponent takes their own responsibilities to the environment. The Mandamus is duly noted.
	The proposed project should be viewed integrally.	**Atty. Sonny Quial**	Duly noted (Similar comments as in the above)
	60 and 300 hectares should be consolidated in approach.	**Mr. Ong of Sofitel**	Duly noted (Similar comments as in the above)

	Projections of the total areas of the different reclamation projects to assess the impact holistically.	**Sister Bernadeth Casas- Assumption Malibay**	Duly noted
	We are not invited in this Public Scoping. Invitations were not sent to us.	**Councilor Bong Tolentino of Pasay City**	Invitations were properly sent and acknowledged received by the City of Pasay. Pasay itself is the Project Proponent
	Some of the slides are misleading from a scientific view. We should know the real issue to mitigate. Quoting personalities should not be made	**Marvin – Representative from National City Agency**	The guidelines of the Revised Procedural Manual are observed. Quoting personalities are made when their statements are made public such as in media releases.
	Public Consultation or Public Hearing-- The rights of the people should be heard. If Project is beneficial, Why are there no Public Consultation?	**Brother Tony Escalona**	This is not a Public Consultation but we will have a Public Consultation
1. **Project Description**	Are there any vertical development	**Edwardson Ong- Legal of Sofitel**	Mix Development. No particular development 30% will be roads and open spaces.
	What is the development for the Proposed 60 and Proposed 300 hectares?	**Grace Makabale- Save Freedom Island Movement**	Mix Use Development- 30% are roads and open space based from the requirement of PRA. Mix Use, -commercial residential based from the need of the City.
2. Land	200 m waterway of all the Proposed reclamation projects. Assurance of the people that there will be no flood and destruction of livelihood of the residents of Pasay, Paranaque and Las Pinas.	**Grace Makabale- Save Freedom Island Movement**	Engineering solutions / interventions to be detailed after the ECC.. ECC will impose conditions and requirements. As an illustration there is a reclamation project that after the issuance of the ECC, circulation relating to flooding was studied and changes were made in the configuration.
	When to conduct actual Environmental Geohazard and Geological Assessment (EGGAR)?	**Felix Tambuko**	This is only a Public Scoping. After this scoping there will a Technical meeting with the EMB and Review Committee composed of technical experts on Land, Air, Water. People etc.. The reports on geological, geological assessment will the EIS. The EIARC will give formal instructions to us if a formal EGGAR .

	Based from the quote from Arch. Palafox that Reclamation is a solution to Metro flooding. In the year 1982, the residents of Don Carlos were not experience flooding. Now that there is a Reclamation Development, we are experiencing flood (Waist level). What more with the Proposed Reclamation.	**Carmensita Macaraeg-Ministry of Ecology**	Arch. Jun Palafox and Arch. Alcarazen respected urban planners were quoted. Blocked esteros and garbage are the main causes of flooding. This is the reason we have extensive dredging projects and esteros cleaning. Moreover, Informal settlers blocking the waterways (ex. Tripa de Gallina) are being move to Cavite to solve flooding in the area. Concern duly noted.
	Based on a study degradation of mountains and reclamation are the true causes of flooding in Metro Manila not the settlers living in the *esteros.*	**Godson Escopete- Defend Manila Bay**	Duly noted. Will be addressed in the EIS.
	Concerns for traffic.	**Godson Escopete- Defend Manila Bay**	We are still in the initial stage of public scoping. The EIS System includes two (2) aspects. 1. What are the problems and what are the solutions. 2. What are the effects/impacts and what are the mitigating measures We will show this in this two aspect in our EIS Report, EMB will say if the EIA report is acceptable or not based on the appreciation of the report by the EMB and the Review Committee/resource persons
	Congestion is not a good reason just to reclaim.		Note: Decongestion is only of the several basis for the project
	There is a bird sanctuary that will be affected even though the proposed project is not within the declared protected area. Everything (ecosystem) connected.	**Marley Mendoza**	Duly noted
3. Water	Blockage of Libertad Channel (water system or canals)- There is a City ordinance that Libertad channel shall not be blocked Because of the 200 meters, Libertad Channel is blocked	**Councilor Bong Tolentino of Pasay City**	No waterways including Libertad Channel will be blocked. A 200 meter easement from the coastline prescribed by the PRA will allow sufficient water circulation. (Flow of water shown in the initial master plan.). This will part of the EIS report.

	Reclamation should be constructed above sea level. Assurance that there will be no flooding in Pasay. How will flooding be mitigated?	**Atty. Sonny Quial**	Duly noted Flooding widely discussed. Will be included in the EIS.
	Concern for Libertad Channel overflow.	**Godson Escopete- Defend Manila Bay**	We are still in the initial stage of public scoping. The EIS System includes two (2) aspects. 1. What are the problems and what are the solutions. 2. What are the effects/impacts and what are the mitigating measures We will show this in this two aspect in our EIS Report . EMB will say if the EIA report is acceptable or not based on the appreciation of the report by the EMB and the Review Committee/resource persons
	Where is the minimum 200 meter wide waterway between CCP and Proposed 60 hectares reclamation? Starting from the embankment of the existing retaining wall?	**Engr. Rommel Roque- GSIS**	200 meters from the coastline is a guideline is at this time from the PRA and will be subject to further evaluation. .
	200 meters wide waterways. Is this the plan that you submit to the PRA?	**Edward Ong- Sofitel Philippines**	Yes but subject for approval. We have to comply with the PRA. Before the reclamation permit we have to be approved by the EMB. We have to follow their guidelines There are still detailed engineering works to be undertaken.
4. People	Who will benefit in this reclamation area? Where are the people who will be displaced?	**Sister Bernadeth Casas- Assumption Malibay**	Duly noted. Power point presentation of EIA Consultant showed benefits to the people of the City
5. Others	Where to get the filling materials; there may not be enough for the project. Environmental degradation such as of mountains in Cavite could result.	**Mrs. Annie Cerdena- Geronimo HOA**	Filling materials to be used is subject to separate approval, and subject to ECC. PRA has to approve the source.. Separate ECC, separate application, separate clearances, separate permitting approvals will be made for the filling materials.
	Where to get the filling Materials for the Proposed 60 and Proposed 300 hectares?	**Grace Makabale- Save Freedom Island Movement**	Filling materials -not until it we have engineering design and we know what we need, type of material and the volumes needed. For planning purposes we will source the filling materials in San Nicolas Shoal .

	Based from my research, PRA reiterated the non-approval of Pasay Reclamation.	**Aya-NUIP**	This was clarified that there are five stages of the process to follow for the reclamation permit. As of the moment the proponent is only in step 1. Based from our meeting with Councilor Bong Tolentino, discussions were about choosing our joint venture partner not about the approval of reclamation permit. Application was submitted last November with PRA. According to PRA we should seek DILG legal opinion if we used the correct process. Based from the legal opinion signed by ASEC Panadero last March, the process we follow is correct.
	How much is the Proposed reclamation project for the Proposed 60 and Proposed 300 hectares. Where to source the funds for the reclamation project. Is it solicited or unsolicited? What category is it now?	**Grace Makabale- Save Freedom Island Movement**	The joint venture partner will spend for the project. NEDA will approve the final shares of the government and the contractor. Proposed Reclamation budget for the Proposed 300 is Php 54.5 billion and Proposed 60 is Php 10.1 billion and still subject for approval by NEDA.
	Why is the Project stated as "proposed"? Or the project is already done? Who is Proposing? Is it Pasay? Or different developers? The design of the area is against the alignment of energy.	**Sister Bernadeth Casas- Assumption Malibay**	"Proposed" before appropriate approvals, including the ECC have yet to be secured. The City of Pasay is the Proponent. Duly noted. Design to be subject for approval of PRA and NEDA. This will still undergo further study.
	PRA -Reclamation should be looked at as a whole	**Edward Ong- Sofitel Philippines**	PRA has a program for the whole Manila Bay Area. They have reclamation plans. When we submitted our proposed project this will be a compliance with their plan. We are supposedly to comply with Boulevard 2000 Project.
	Cab the Proposed 60 hectares can go independently?	**Edward Ong- Sofitel Philippines**	Yes, Proposed 60 hectares is separate from the 300 hectares. That is why the Project is titled "Proposed 60 and 300 hectares".

	PD 1151 was cited	**Loreto Saturnino- Sta. Clara de Montefalco**	Duly noted

STAKEHOLDER REPRESENTATIIVES(ATTENDANCE SHEET ATTACHED IN ANNEX 4)

ANNEX 7

PUBLIC SCOPING
PROPOSED 60 HECTARES and 300 HECTARES RECLAMATION PROJECT
To be located along the coast of Manila Bay, City of Pasay

IS THERE A WATERWAY BETWEEN CCP AND THE PROPOSED 60 HECTARES? WHAT IS THE DISTANCE?

FROM: ATTY. FELIX SALVADO
CCP - 8527459

PUBLIC SCOPING
PROPOSED 60 HECTARES and 300 HECTARES RECLAMATION PROJECT
To be located along the coast of Manila Bay, City of Pasay

Feedback
1) ~~Question~~ from DOT-NCR

May we request that, the ff experts in the field of environment, architecture be invited in the next public scoping/consultation so that the participants present will be properly informed of essential issue

1. Arch Palafox
2. Arch Alcazaren
3. Mahar Mangahas
4. Tony Oposa

Email: ncr@tourism.gov.ph

Please include as your paramount consideration the solution to the FLOOD problem particularly Maricaban, Ptamo, Malibay and F. B. Harrison.

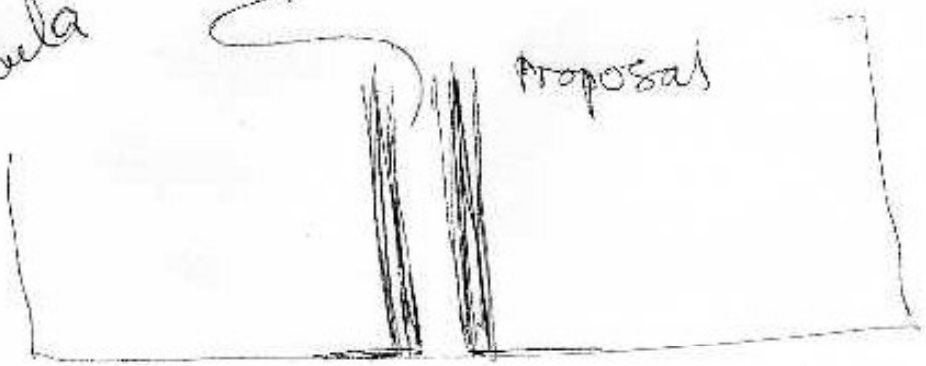
From councilor Richard Advincula

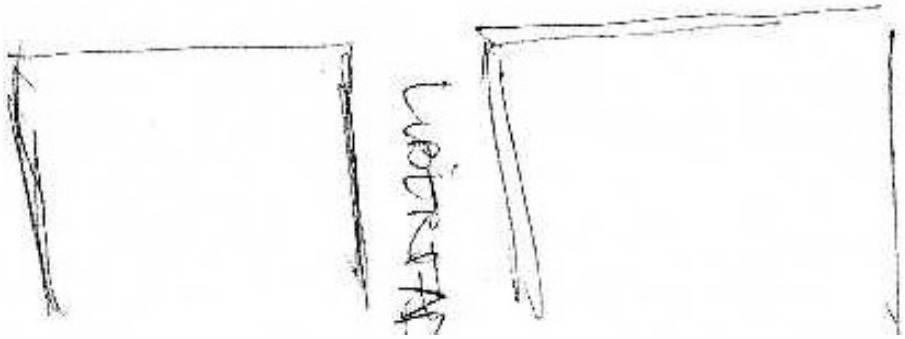
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(2)

From councilor Richard Advincula

Please include this in your report.





PUBLIC SCOPING
PROPOSED 60 HECTARES and 300 HECTARES RECLAMATION PROJECT
To be located along the coast of Manila Bay, City of Pasay

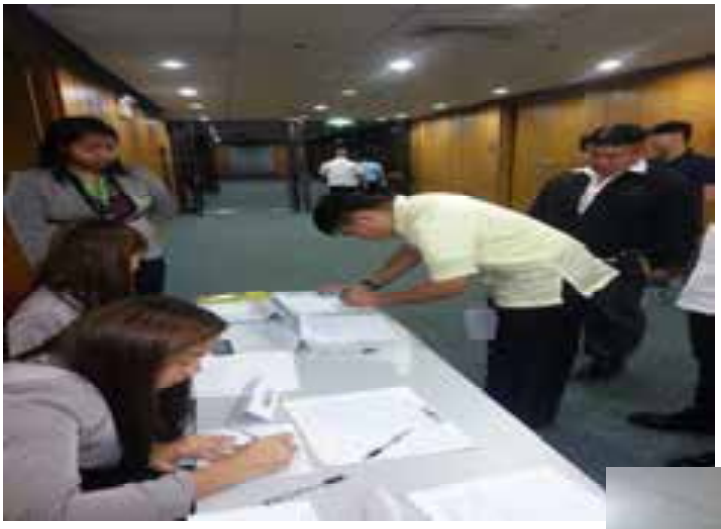
ANO KUKUNIN ANG FILL MATERIALS?

NO- ANO ANG MGA EPekto SA PROPOSED RECLAIM AREA NG 60 AT
100 HECTARES?

EPekto ANG HANGIN AT PROPOSED RECLAMATION PROJECT AT SA MGA KULIG
MANGGAGALING ANG PONDS PARA DITO?

ANNEX 8

REGISTRATION







OPENING REMARKS: HONOURABLE PASAY CITY MAYOR ANTONINO G. CALIXTO



PROJECT PRESENTATION



Atty. Severo C. Madrona, Jr.
City of Pasay Legal Officer



Dr. Edgardo G. Alabastro, Ph.D.
EIA Consultant

PORTION OF THE PARTICIPANTS







OPEN FORUM



Ms. Lou Arsenio
RCAM Ecology



Ms. Loreto Saturnino
RCAM/Sta. Clara



Atty.Felix S. Sayago
CCP

OTHER DOCUMENTS

Welcome Remarks of the
Honorable Antonino G. Calixto
Mayor, City of Pasay



Key Points

- Presence of participants an assurance of transparency
- Reclamation …Not only for the future of Pasay but also for the country..enable the City to respond to growth and to limitations in land area
- Will go through the correct process and comply with all the requirements of the law
- You can ask all questions; We may not be able to reply now to all because we will refer to experts some issues
- In public consultation you will get all the responses… This is not the last
- We realize that you have concerns about the project
- This Scoping allows the public to articulate and guide the LGU in their decision making
- The City commits compliance with environmental regulations

Archdiocese of Manila
Vicariate of Sta. Clara de Montefalco
2360 P. Burgos Street, Pasay City

July 04, 2014

HONORABLE ANTONINO CALIXTO
Mayor
City of Pasay

Dear Mayor Calixto,

Greetings of Peace!

It has come to our knowledge through newspaper publications and concerned citizens that the City of Pasay is embarking on reclamation projects in Manila Bay. We also read from the newspapers that the project was already awarded to SMDC. Very recently, we were also informed by the Archdiocese of Manila Ministry on Ecology that a Project Scoping is already scheduled for July 9, 2014.

We, the local voters and parish priests of the 11 parishes and shrines of the City of Pasay, were surprised to learn that our City and the project proponent are already in the preparatory process of applying for an ECC even before massive public consultations could be held by the City Council. Our parishes and parishioners were not properly informed of your reclamation projects to enable them to formulate an informed judgment as to your project's wisdom and propriety.

We believe that before a project of such a grand scale and huge environmental impact could even proceed, a massive public consultation process should first be conducted. The people should be given the opportunity to comment on whether to allow such project given the life-changing and earth-shaking nature of reclamation projects.

In the absence of massive public consultation and in the interest of transparency, we strongly appeal that you stop the conduct of the Public Scoping schedule for July 9, 2014 pending the conduct of public consultations with the public and concerned stockholders. We are offering our parishes as venue for the public consultation and we are willing to assist you in the conduct thereof.

RECEIVED CITY MAYOR
7-07-14
2:45 PM

We trust you will give us and the people the opportunity to be heard before you allow the reclamation project to continue.

Yours truly in the service of God and country.

REV. MSGR. CESAR B. PAGULAYAN
Vicar Forane & Parish Priest
San Isidro Labrador Parish
1830 Taft Ave., Pasay City

REV. MSGR. MODESTO M. TESTON
Parish Priest
Our Lady of the Airways
Chapel Rd. cor. Aquino Ave.
NAIA, Pasay City

REV. MSGR. ROBERTO C. CANLAS
Rector
Archdiocesan Shrine of Jesus the Way,
The Truth & the Life
Central Business Park,
Reclamation Area, Pasay City

REV. FR. NICARDO P. BLANQUISCO
Parish Priest
Sta. Clara de Montefalco Parish
2360 P. Burgos St., Pasay City

REV. FR. ROLLIN I. FLORES
Parish Priest
Our Lady of Sorrow Parish
2130 F.B. Harrison, Pasay City

REV. FR. REYNALDO S. BUNGAY
Parish Priest
San Rafael Parish
2645 Park Ave., Pasay City

REV. FR. ANTONIO B. NAVARRETE
Parish Priest
San Juan Nepomuceno Parish
C. Jose St. Malibay, Pasay City

REV. FR. MICHAEL D. KALAW
Parish Priest
Our Lady of Fatima Parish
Constellation Drive, Don Carlos Village
Pasay City

REV. FR. ALVIN A. FULLON
Parish Priest
Mary, Comforter of the Afflicted
St. Peter cor. St. Catherine Sts.
Maricaban, Pasay City.

REV. FR. DOMINGO G. ASUNCION
Parish Priest
Our Lady of the Most Blessed Sacrament
Kalayaan Village, Pasay City

REV. FR. PASCHAL M. GORGOÑA
Parish Priest
San Roque Parish
2826 Cabrera St., Pasay City

Republic of the Philippines
OFFICE OF THE CITY LEGAL OFFICER
Pasay City, Metro Manila

July 7, 2014

RECEIVED
08 JUL 2014

Rev. Msgr. Cesar B. Pagulayan
Vicar Forane & Parish Priest
San Isidro Labrador Parish
1830 Taft Ave., Pasay City

Dear Fr. Pagulayan,

This refers to the letter dated July 4, 2014 which was received by the Office of the City Mayor on July 7, 2014 by the Vicariate of Sta. Clara de Montefalco requesting the City Government to discontinue the conduct of public scoping on July 9, 2014 as to its proposed reclamation project pending the conduct of public consultations with the concerned stakeholders. The Vicariate offers the parishes within the city for public consultation and in the conduct thereof.

With all due respect, your Excellency, *public scoping* is initiated by the City Government to *define* the range of actions, alternatives and impacts of the proposed reclamation project. Public scoping is the public consultation required by the Department of Environmental and Natural Resources for the project proponent City Government of Pasay to have a ***dialogue*** with the ***key stakeholders*** of the proposed project, concerned Government Agencies, Non Governmental Organizations, Peoples' Organizations and affected/adjacent communities. Representatives from the Environmental Management Bureau (EMB) of the Department of Environment and Natural Resources will witness the event.

Pursuant to DENR Administrative Order No. 2000 – 05 dated January 6, 2000, scoping is conducted to (a) Provide an early link between the DENR and the proponent to ensure that the Environment Impact Assessment addresses relevant issues and presents results in a form consistent with the Environment Impact Statement programmatic compliance requirements; (b) Allow the stakeholders to make their concerns known to ensure that the Environmental Impact Assessment adequately addresses the relevant issues; (c) Address issues on carrying or assimilative capacity of the environment and identify possible legal constraints or requirements regarding the project proposal; and (d) Determine and agree on the assessment methodologies and process of dealing with issues relating to social acceptability.

Thus, the requested *public consultation* as expressed in your letter is the *same purpose* of the *public scoping* to be conducted by the City Government. We want to know the various concerns of our constituents as regards the proposed project. Your attendance and your parishioners will help us in further deepening all *relevant* issues related to the reclamation projects within the territorial boundaries of the City of Pasay.

Thank you.

Very truly yours,

Atty. Severo C. Madrona, Jr.
City Legal Officer

7/8/2014

Annex 1.0

DENR Protocol

Annex 2.0a

Public Scoping Report

Annex 2.0b

The Submitted Pre-IEC and Related Activities

Annex 3a

Resolution No.4373

Annex 3b

Resolution No. 4324

Annex 4.0
Discussion of the Mandamus

Annex 5.0
Test Results

Annex 5.0

Water Test Results

Annex 5.0
Air Test Results

Annex 6.0

Windrose

Annex 7.0

Proclamation No.41

Annex 8.0

Draft MMT, EGF and EMF Memorandum Agreement

Annex 9.0

PEMAPS

Annex 10.0
Accountability Statements

Annex 11.0

Photograph of the Project Site and the Impact Area

Annex 12.0
Screening Checklist

Annex 13.0

Area Clearance Application

Annex 14.0

Public Hearing Report

Annex 15.0

Administrative Order No. 224 Amending Administrative Order 176 "Creating Presidential Task Force Boulevard 2000"

Annex 16.0

President Aquino's Speech in Paris

Annex 17.0

Copy of Signed MOU between City of Pasay and PRA

Summary List of Pre-Scoping IEC Activities and Issues

1. Public Scoping - February 2013

Photographs:



Plate 1.0- Public Scoping



Plate 3.0- Registration for Public Scoping. Some of the stakeholders / participants registering to the scoping session



Plate 2.0- Registration for Public Scoping



Plate 4.0- Mayor Antonino Calixto during the Public Scoping





Plate 7.0- Session Moderator Edgardo G. Alabastro Ph, D. of the EIA Preparer Team.



Plate 6.0- Various Photographs of the Session



Plate 8.0- Participants address their concerns during the Open Forum Session

ISSUES / CONCERNS RAISED DURING THE PUBLIC SCOPING

EIA Module	Issues/Suggestions Raised by Stakeholder	Sector or Representative Who Raised the Issue/ Suggestion	Proponent's Response
1. Project Description	• Are there any vertical development	Edwardson Ong- Legal of Sofitel	Mix Development. No particular development 30% will be roads and open spaces.
	• Pasay City government financial expenses.	Armida Cerdenas- President of Geronimo Homeowners	Pasay will not have financial expenses with regards to this.
	• Source of funding	Cesar of Phil. Tourism Authority	It is a PPP project (Public-Private Partnership)
	• How wide the reclaimed area from the seawall	CCP representative	500 meters wide
2. Land	• Land subsidence	Atty. Felix Sayago -CCP representative	There would be such impact of land subsidence as a result of Pasay Project
	• Waste control system	George Misa -CCP representative	Our end is to find a common solution
	• Main road going to reclamation	Edwarson Ong Sofitel Representative	As of the moment no concrete plans (PRA)

EIA Module	Issues/Suggestions Raised by Stakeholder	Sector or Representative Who Raised the Issue/ Suggestion	Proponent's Response
	• Liquefaction, subsidence		There are certainly engineering interventions for seismicity.
3. Water	• 50 meter canal GSIS area canal (from Toyota to Libertad channel)	Danilo Martinez GSIS representative	50 meter canal is a requirement by the PRA.
	• How can we show that the project is a compliant to Manila Bay coastal strategy	Robert Jara- PEMSEA representative	Our obligation to this application is to complied with Manila Bay coastal strategy
	• Impact of reclamation on water degradation		Engineering designs come into place
	• Proof that reclamation is a solution to flooding		
	• Buffer storm surge (sea level rise)		
	• Provide mangroves species portion of reclamation area , seawall has a life span	Teresa Salanguit–Coastal Manila Bay Coordinating	There will be no cutting of mangroves. Enhancement aspect for the project.
	• Are there any no fish in Manila Bay?	Armida Cerdenas- President of Geronimo Homeowners	There are no **significant** fish species.

EIA Module	Issues/Suggestions Raised by Stakeholder	Sector or Representative Who Raised the Issue/ Suggestion	Proponent's Response
	• Flooding due to rainfall aggravated	George Misa -CCP representative	Our end is to find a common solution
	• Safeguard measures in Manila Bay to not further deteriorate	Danilo Martinez GSIS Representative	Proposed but at the moment it is subject for the approval of PRA
4. People	• Security measure at the back of Coconut Palace	Danilo Martinez GSIS representative	The Barangay is a direct beneficiary of ER 1-94. The Proponent will assist the barangay to access the benefits under it.
	• Facility for the children that are free	Sr. Carissa C. Moldez	Part of the planning of the area is the open spaces. 30% of the dev. Is open spaces
	• Measures on prediction on influx of people	Representative from Public Information Office	There are regular meetings to address the issue. The reclamation project will provide services along with the help of national government not only LGU.
	• Local job employments	Vilma Penos Family Touch	Pasay Residents priority

EIA Module	Issues/Suggestions Raised by Stakeholder	Sector or Representative Who Raised the Issue/ Suggestion	Proponent's Response
	• Include Manila Bay in Tourism	Raffy Celis –DOT NCR	Mandamus
8. Others	• Height Requirement	GSIS Representative	There is a height requirement
	• View of the Sunset	Antonio Arevalo- Office of the VP representative Danilo Martinez GSIS representative	There is a height requirement
	• Environmental, Cultural and Historical impact / aspect	Atty. Felix Sayago -CCP representative	Environmental- there is an ECC application for environmental compliance
	• Is reclamation the only way that City of Pasay Progress		
	• Conserve and preserve the national heritage	Robert Jara- PEMSEA representative	We say that this application, our obligation is to complied with Manila Bay coastal strategy

EIA Module	Issues/Suggestions Raised by Stakeholder	Sector or Representative Who Raised the Issue/ Suggestion	Proponent's Response
	• Basis for the designs		Engineering designs come into place
	• Status, Process and timetable of project	Edwardson Ong- Legal of Sofitel	ECC alone maybe 3-4 months. ECC is not a permit. It is a planning tool. It is now on the City of Pasay on the timetable. Pasay, 4 years period. Horizontal dev. After 4 years is the development
	• Comparison of Pasay and Manila Project		This project is different and independent. It will go to a process
	• Vision on what type of commercial establishment and investor	Cesar of Phil. Tourism Authority	As of the moment, no exact how many or type of establishments. The project is a horizontal development.

2. Key Informant Interview - May 29, 2013

Issues Raise:

- *View of the sunset- The development will block our sunset view. When we bought our site, sunset view is one of the reasons that we have high value of property.*
- *The development should identify its restriction and have a proper zoning before starting. It should be clear why the proposed site is situated near the sunset view of Philippine Sofitel not in other parts of Manila Bay such as near the US Embassy.*
- *If ever it will have problem during its operation and encountered a problem such as the drainage, the project should identify who will fund the said problem because if ever the local government do not have enough fund we will be affected just like what happen in nearby Toyota.*

3. **News Paper Releases**

SM to complete Pasay City reclamation project in 5 years

Exec says group to invite foreign investors

By Doris C. Dumlao
Philippine Daily Inquirer
11:28 pm | Friday, January 10th, 2014

The SM group expects to complete a 300-hectare Pasay City reclamation project worth P54.5 billion within five years and bring in other groups to participate in the development, including prospective foreign investors.

"It's not something that only we will develop. We will take in other developers. We've been in talks with some foreign groups coming in," SM Prime Holdings president Hans Sy told reporters on Thursday in an interview at the sidelines of an Urban Land Institute event.

The Pasay City Council recently voted to proceed with the controversial reclamation project through a joint-venture agreement between SM Land Inc., a property unit under SM Prime, and the local government under Mayor Antonino Calixto.

Sy said the SM group would finish the master plan for the project within the first quarter with the help of a foreign consultant, which is working in collaboration with local experts.

The P54.5-billion investment, he said, would cover only the reclamation and would not be a one-shot deal. He said further investments would be made to implement the master plan.

"The whole process of reclamation is about five years and to do drainage system, to make it land for development," Sy said.

Sy said the SM group was confident on making this project work, drawing experience from its Mall of Asia complex, which he noted fared very well during the monsoon season and was not affected by a storm surge in Roxas Boulevard. As an internal policy, Sy said the SM group was doing "beyond what's required" by building guidelines.

Of the 300-hectare project, around half of the area to be reclaimed, including roads and open spaces, will go to SM and the rest to the local government.

Given the constitutional restriction on foreign ownership of land to 40 percent, the SM group intends to bring in foreign investors to the project in line with such limitation. Sy said that "40 percent is still a big chunk (for foreign investors to become interested)."

"It's very attractive. A lot of people don't see the big opportunities," he said.

Sy also said that SM would embark on an "environment-friendly" reclamation process. "When it comes to reclamation, some are thinking I will carve a mountain and fill up the water but what we will do and what we did in MOA is dredging—getting from the bottom of the seabed and putting all up so the balance of sea and land is still there," he said.

The SM group is setting up a team to explain these things to the people, Sy said.

Meanwhile, Sy refuted rumors that SMPH would tap the capital markets soon after the consolidation of key SM property units under its wings.

"I'd like to get the complete picture first with consolidation and after the first quarter, we will know our capex (capital expenditure). There's no plan to go to the capital market yet," Sy said.

4. Meetings with LGU – 23 April 2012 JOINT COMMITTEE HEARING

Attendees:

Pasay City Council
City Engineer's Office
Division Chief
PRA Representative
RASA Surveying
PICC
Sofitel Manila
GSIS
Environmental Professional

Issues and Concerns Raised

- *What are the effects of this project to the environment?*
- *Is the project do have chance to be issued by an ECC?*
- *What are the guidelines to be considered before the development construction?*
- *" Rain water effect and Mapapalayo ang drainage system"*
- *Legality of the projects?*
- *Effect of reclamation on Manila Bay water level rise.*

5. Meetings with LGU – 30 April 2012 JOINT COMMITTEE HEARING

Attendees:

Pasay City Council
City Engineer's Office
Division Chief
City Planning
City Budget Department
PRA Representative
RASA Surveying
PICC Representative
Sofitel Manila Representative
GSIS Representative
Gloria Maris Representative
Office of the Vice President
Barangay's 76 &13
Representative from Senate
EIA Consultant

Issues and Concerns Raised

- *How do you communicate or coordinate with the contractors so that we can respond to climate change?*

6. Meetings with LGU – 08 August 2013 JOINT COMMITTEE HEARING

Attendees:

Pasay City Council
City Engineer's Office
Division Chief
City Planning
EIA Consultant
CENRO
SM Land, Inc.
Barangay 76, Pasay

Issues and Concerns Raised

- *Viability of the proposed expansion of the area of reclamation.*
- *Project Impact on Pasay City once completed?*

Annex B

Meetings with LGU – 08 August 2013 JOINT COMMITTEE HEARING

Attendees:

Pasay City Council
City Engineer's Office
Division Chief
City Planning
EIA Consultant
CENRO
SM Land, Inc.
Barangay 76, Pasay

Issues and Concerns Raised

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Annex C

News Paper Releases

Home > Business > Headlines > SM to complete Pasay City reclamation project in 5 years

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Annex D

Key Informant Interview - May 29, 2013

Issues Raise:

- *View of the sunset- The development will block our sunset view. When we bought our site, sunset view is one of the reasons that we have high value of property.*
- *The development should identify its restriction and have a proper zoning before starting. It should be clear why the proposed site is situated near the sunset view of Philippine Sofitel not in other parts of Manila Bay such as near the US Embassy.*
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Annex E

Public Scoping - February 2013

Photographs:



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Plate 3.0- Registration for Public Scoping. Some of the stakeholders / participants registering to the scoping session



Plate 2.0- Registration for Public Scoping



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Plate 7.0- Session Moderator Edgardo G. Alabastro Ph, D. of the EIA Preparer Team.



Plate 6.0- Various Photographs of the Session



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ISSUES / CONCERNS RAISED DURING THE PUBLIC SCOPING

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1. Project Description	• Are there any vertical development	Edwardson Ong- Legal of Sofitel	Mix Development. No particular development 30% will be roads and open spaces.
	• Pasay City government financial expenses.	Armida Cerdenas- President of Geronimo Homeowners	Pasay will not have financial expenses with regards to this.
	• Source of funding	Cesar of Phil. Tourism Authority	It is a PPP project (Public-Private Partnership)
	• How wide the reclaimed area from the seawall	CCP representative	500 meters wide
2. Land	• Land subsidence	Atty. Felix Sayago -CCP representative	There would be such impact of land subsidence as a result of Pasay Project
	• Waste control system	George Misa -CCP representative	Our end is to find a common solution
	• Main road going to reclamation	Edwarson Ong Sofitel Representative	As of the moment no concrete plans (PRA)

EIA Module	Issues/Suggestions Raised by Stakeholder	Sector or Representative Who Raised the Issue/ Suggestion	Proponent's Response
	• Liquefaction, subsidence		There are certainly engineering interventions for seismicity.
3. Water	• 50 meter canal GSIS area canal (from Toyota to Libertad channel)	Danilo Martinez GSIS representative	50 meter canal is a requirement by the PRA.
	• How can we show that the project is a compliant to Manila Bay coastal strategy	Robert Jara- PEMSEA representative	Our obligation to this application is to complied with Manila Bay coastal strategy
	• Impact of reclamation on water degradation		Engineering designs come into place
	• Proof that reclamation is a solution to flooding		
	• Buffer storm surge (sea level rise)		
	• Provide mangroves species portion of reclamation area , seawall has a life span	Teresa Salanguit–Coastal Manila Bay Coordinating	There will be no cutting of mangroves. Enhancement aspect for the project.
	• Are there any no fish in Manila Bay?	Armida Cerdenas- President of Geronimo Homeowners	There are no **significant** fish species.

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4. People	• Security measure at the back of Coconut Palace	Danilo Martinez GSIS representative	The Barangay is a direct beneficiary of ER 1-94. The Proponent will assist the barangay to access the benefits under it.
	• Facility for the children that are free	Sr. Carissa C. Moldez	Part of the planning of the area is the open spaces. 30% of the dev. Is open spaces
	• Measures on prediction on influx of people	Representative from Public Information Office	There are regular meetings to address the issue. The reclamation project will provide services along with the help of national government not only LGU.
	• Local job employments	Vilma Penos Family Touch	Pasay Residents priority

EIA Module	Issues/Suggestions Raised by Stakeholder	Sector or Representative Who Raised the Issue/ Suggestion	Proponent's Response
	• Include Manila Bay in Tourism	Raffy Celis –DOT NCR	Mandamus
8. Others	• Height Requirement	GSIS Representative	There is a height requirement
	• View of the Sunset	Antonio Arevalo- Office of the VP representative Danilo Martinez GSIS representative	There is a height requirement
	• Environmental, Cultural and Historical impact / aspect	Atty. Felix Sayago -CCP representative	Environmental- there is an ECC application for environmental compliance
	• Is reclamation the only way that City of Pasay Progress		
	• Conserve and preserve the national heritage	Robert Jara- PEMSEA representative	We say that this application, our obligation is to complied with Manila Bay coastal strategy

EIA Module	Issues/Suggestions Raised by Stakeholder	Sector or Representative Who Raised the Issue/ Suggestion	Proponent's Response
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	• Status, Process and timetable of project	Edwardson Ong- Legal of Sofitel	ECC alone maybe 3-4 months. ECC is not a permit. It is a planning tool. It is now on the City of Pasay on the timetable. Pasay, 4 years period. Horizontal dev. After 4 years is the development
	• Comparison of Pasay and Manila Project		This project is different and independent. It will go to a process
	• Vision on what type of commercial establishment and investor	Cesar of Phil. Tourism Authority	As of the moment, no exact how many or type of establishments. The project is a horizontal development.

ANNEX
PUBLIC SCOPING LIST OF ISSUES

Project Name	**Proposed 60 Hectare Reclamation Project.**	Project Location	Barangay: **Along the coast of Manila Bay** Municipality/City: **Pasay City** Province:
Proponent Name	**Pasay City Government**	Proponent Address	**Pasay City Hall –FB Harisson St., Pasay City**
Proponent Contact Person	**Atty. Severo Madrona**	Proponent Means of Contact	Landline No : **(02) 833-3729** Fax No. : Mobile No : Email :
EIA Consultant	**Technotrix Consultancy Services, Inc.**	Consultant Address	Suite 603 FMSG Building #9 Balete Drive, New Manila Quezon City
EIA Consultant Contact Person	**E.G. Alabastro, Ph.D.**	Consultant Means of Contact	Landline No **:02-4164625** Fax No. **: 02-4164625** Mobile No **:0917.8255203** Email **: technotrixinc@gmail.com**
EMB/DENR Scoping Representatives	**EMB- NCR:** **Eng. Gil F. Ferareza**	Place of Public Scoping	**Tramway Restaurant, 1600 Roxas Boulevard Cor. Layag St. Pasay City**
		Date of Public Scoping	**20 February 2013**

ISSUES / CONCERNS TO BE INCLUDED IN THE SCOPE OF THE EIA STUDY

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	• Vision on what type of commercial establishment and investor	Cesar of Phil. Tourism Authority	As of the moment, no exact how many or type of establishments. The project is a horizontal development.

STAKEHOLDER REPRESENTATIIVES(ATTENDANCE SHEET ATTACHED IN ANNEX 3)

REPRESENTATIVE/S OF THE PROJECT PROPONENT

Hon. Antonino G. Calixto, City Mayor	Atty. Severo C. Madrona, Jr. City Legal Officer		
Signature over Printed name	Signature over Printed name	Signature over Printed name	Signature over Printed name

EIA CONSULTANTS:

Matilde R. Jimenez-Fernando, LLB	Edgardo G. Alabastro, Ph.D.
Signature over Printed name	Signature over Printed name

Republic of the Philippines
Department of Environment and Natural Resources
ENVIRONMENTAL MANAGEMENT BUREAU
DENR Compound, Visayas Avenue, Diliman, Quezon City 1116
Telephone Nos.: 927-15-17, 928-20-59
Email : emb@emb.gov.ph
Visit us at http://www.emb.gov.ph

MAR 1 1 2014

MR. EDGARDO G. ALABASTRO, PH. D.
EIA Preparer
TECHNOTRIX CONSULTANCY SERVICES INC.
Suite 603 FMSG Bldg.
#9 Balete Drive, New Manila Quezon City

Subject: Proposed 360 Hectares Reclamation Project

Dear Mr. Alabastro:

This refers to your letter dated January 27, 2014 regarding the schedule public scoping of the proposed 360 Hectares Reclamation Project. Please be reminded that prior to the conduct of Public Scoping, sufficient Social Preparation, Pre-Scoping Information, Education and Communication (IEC) Activities with the local community and concerned stakeholders should be conducted as detailed in Annex 2-3 and Annex 2-7c of the Revised Procedural Manual for DENR Administrative Order No. 30, Series of 2003.

Hence, absence of any proof of full compliance, this Office cannot favorably consider such a request.

For your information and guidance.

Very truly yours,

ATTY. MICHAEL DRAKE P. MATIAS
OIC-Chief, EIA Management Division

170142-5-2

Republic of the Philippines
PHILIPPINE RECLAMATION AUTHORITY
(Public Estates Authority)
7th floor, Legaspi Towers 200 Bldg., 107 Paseo de Roxas St., Legaspi Village, 1226 City of Makati
Tel. Nos.: (02) 817-4711 to 13, (02) 813-1441 to 45 • Facsimile No.: (02) 815-2662
Website: www.pea.gov.ph • Email: info@pea.gov.ph

SECRETARY'S CERTIFICATE

SO THE PUBLIC MAY KNOW:

I, **ARNOLD C. MORALEJO**, of legal age, Filipino, with office address at the 8th Floor, Legaspi Towers 200 Building, 107 Paseo de Roxas, Legaspi Village, Makati City, after having been duly sworn, hereby certify that:

1. I am the Acting Board Secretary of the Philippine Reclamation Authority (PRA);

2. At the 498th Regular Meeting of the PRA Board of Directors on 24 July 2013, duly called for the purpose, a quorum being present and acted throughout, the following resolution was unanimously adopted with the concurrence of the Chairman, and is now in full force and effect, to wit:

Resolution No. 4373
Series of 2013

ADOPTION OF THE GOVERNMENT CENTER RECLAMATION PROJECT AS A PRIORITY PROJECT

RESOLVED, That the proposed Government Center Reclamation Project (the "Project") with an aggregate area of 300 hectares, more or less, located along Manila Bay and within the territorial jurisdiction of the City of Pasay, directly fronting the CCP Complex, Financial Center Area, and CBP 1-A, as shown in the hereto attached Sketch Plan (Annex "A"), is hereby ADOPTED as a priority project, subject to the following terms and conditions:

1. *The Project shall be undertaken by the PRA without any financial exposure to the National Government through a land sharing arrangement such that the PRA land share in the Project shall be 54 hectares, more or less, all of which shall be saleable areas;*

2. *The PRA may enter into a contractual arrangement with another government entity (GE), including a local government unit (LGU), in order to finance and implement the Project, and the latter may, at its option, likewise enter into other contractual arrangements allowed under existing laws, such as but not limited to joint venture or public-private partnership (PPP), subject to compliance with the legal and procedural requirements of competitive bidding: Provided, That the PRA shall exercise oversight functions over such bidding process.*

3. *The Project shall be under the general supervision and monitoring of the PRA, for which the latter may charge applicable fees;*

4. *Prior to the signing of a Memorandum of Agreement (MOA) between PRA and the GE, the Project shall be elevated to the NEDA ICC for approval;*

5. *The signed MOA shall be subject to ratification by the PRA Board; and*

6. *Prior to the issuance of a Notice to Proceed (NTP), the GE shall secure an Area Clearance and Environmental Compliance Certificate (ECC) from the Department of Environment and Natural Resources (DENR) as well as "no objection" letters / clearance from concerned government agencies.*

RESOLVED, FURTHER, That, without prejudice to the foregoing terms and conditions, the General Manager/CLO is hereby authorized to negotiate, enter into, sign, and execute a Memorandum of Agreement (MOA) with the GE for the implementation of the Project.

Signed on 13 August 2013 at Makati City, Metro Manila.

ARNOLD C. MORALEJO
Acting Board Secretary

ATTESTED BY:

ROBERTO T. MULDONG
Chairman

PETER ANTHONY A. ABAYA
General Manager/CEO, Member

MANUEL C. MEDINA
Member

VIRGILIO T. AMBION
Member

REYNALDO B. ROBLES
Member

RENE ENRIQUE M. SILOS
Member

SHERISA P. NUESA
Member

PHILIPPINE RECLAMATION AUTHORITY
(Public Estates Authority)
8th floor, Legaspi Towers 200 Bldg., 107 Paseo de Roxas St., Legaspi Village, 1226 City of Makati
Tel. Nos.: (02) 817-4711 to 13, (02) 813-1441 to 45 • Facsimile No.: (02) 815-2660
Website: www.pea.gov.ph • Email: info@pea.gov.ph

SECRETARY'S CERTIFICATE

SO THE PUBLIC MAY KNOW:

I, **ARNOLD C. MORALEJO**, of legal age, Filipino, with office address at the 8th Floor, Legaspi Towers 200 Building, 107 Paseo de Roxas, Legaspi Village, Makati City, after having been duly sworn, hereby certify that:

1. I am the Acting Board Secretary of the Philippine Reclamation Authority (PRA);

2. At the 480th Regular Meeting of the PRA Board of Directors on 03 February 2012, duly called for the purpose, a quorum being present and acted throughout, the following resolution was unanimously adopted with the concurrence of the Chairman, and is now in full force and effect, to wit:

Resolution No. 4234
Series of 2012

PASAY CITY RECLAMATION PROJECT

RESOLVED, That the proposed reclamation project of the City Government of Pasay with an area of up to 60 hectares within its territorial jurisdiction along Manila Bay adjacent to the CCP Complex and the Financial Center Area (FCA), as shown in the submitted Sketch Plan, is hereby APPROVED, subject to strict compliance with pertinent laws, rules and regulations.

RESOLVED, FURTHER, That the General Manager/CEO is hereby authorized to negotiate, enter into, sign, and execute a Memorandum of Agreement (MOA) with the City Government of Pasay for the implementation thereof under a 60%-40% land sharing arrangement on the Government land share of not less than 12.6 hectares of saleable areas in favor of PRA, such that the PRA land share shall not be less than 7.6 hectares of saleable areas, subject to the confirmation of such MOA by the Board of Directors.

Signed on 06 February 2012 at Makati City, Metro Manila.

ARNOLD C. MORALEJO
Acting Board Secretary

CERTIFIED TRUE COPY

Lakasan ang Kakayahan Ramdam ang Kaunlaran

ATTESTED BY:

ROBERTO T. MULDONG
Chairman

PETER ANTHONY A. ABAYA
General Manager/CEO, Ex-Oficio Member

ATTY. MANUEL C. MEDINA
Member

ERNESTO M. PUNZALAN
Member

ATTY. REYNALDO B. ROBLES
Member

RENE ENRIQUE M. SILOS
Member

ROSELLER Z. VALERA
Member

CERTIFIED TRUE COPY

CRL Environmental Corporation

08 September 2014

Technotrix Consultancy Services, Inc.
305, FMSG Bldg., cor. 3rd St., Brgy. Mariana, Balete Dr.
New Manila, Quezon City

ATTN: **Ms. Nadia C. Perez - Conde**

Project Name: N/S
Lab. Nos.: P00051069-01/02

Enclosed are the results for samples received by CRL Environmental Corporation and tested for the parameters in the enclosed chain of custody.

Our DENR Recognition with C. R. No. 073/2012, will expire on April 13, 2015.

Likewise, our DOH Accreditation with Accreditation No. 3-001-14-LW-2, is valid from January 01, 2014 until December 31, 2016.

Please note that any unused portion of the sample/s will be discarded 30 days after the date of this report, unless you have requested otherwise.

Thank you for the opportunity to service the needs of your company. Please feel free to call us at (045) 599-3943 or (02) 552-5100 if we can be of further service to you.

Very truly yours,

MARIA CONSUELO CAPULI
Chief Operating Officer

Results of Analyses

Technotrix Consultancy Services, Inc.
305, FMSG Bldg., cor. 3rd St., Brgy. Mariana, Balete Dr.
New Manila, Quezon City

ISO 17025:2005 ACCREDITED TESTING LABORATORY

ES#: P0002260-001

Date Received: 05/25/2014

Lab No.: P0005100

Project Name: N/S

Attention: Ms. Nadia C. Perez - Conde

Test Description	Results	Units	MDL	Test Methods	Date Analyzed	By	Ref
Sample No.: P0005100-01				**DateSampled: 05-24-14 00:00**			
Sample ID: NS S1				**Matrix: Sludge**			
-Metals-							
Arsenic	1.1	mg/kg	0.7*	Gaseous Hydride AAS	05/27/14	RPC	
Cadmium	ND	mg/kg	0.1	Flame AAS	05/31/14	RPC	
Lead	5.7	mg/kg	1.0	Flame AAS	05/31/14	RPC	
Mercury	ND	mg/kg	0.05	Manual Cold Vapor AAS	06/02/14	MAP	
-Wet Chemistry-							
Hexavalent Chromium	ND	mg/kg	1.0*	Diphenylcarbazide, Colorimetric Method (SM3500-Cr D)	05/28/14	CAV	

*** end of result set for Sample No. P0005100-01 ***

Sample No.: P0005100-02			**DateSampled: 05-24-14 00:00**			
Sample ID: NS S2			**Matrix: Sludge**			
-Metals-						
Arsenic	2.1	mg/kg	0.7*	Gaseous Hydride AAS	05/27/14	RPC
Cadmium	ND	mg/kg	0.1	Flame AAS	05/31/14	RPC
Lead	5.7	mg/kg	1.0	Flame AAS	05/31/14	RPC
Mercury	ND	mg/kg	0.05	Manual Cold Vapor AAS	06/02/14	MAP
-Wet Chemistry-						
Hexavalent Chromium	ND	mg/kg	1.0*	Diphenylcarbazide, Colorimetric Method (SM3500-Cr D)	05/28/14	CAV

*** end of result set for Sample No. P0005100-02 ***

*** end of result set for Lab No. P0005100. Total no. of samples analyzed: 2 ***

*As Reporting Limits

NS = Not Supplied

MDL = Method Detection Limits

ND = Not Detected (Below MDL / Reporting Limits)

Results are reported "as dry basis".

Vanlen / Shimadzu Analytical Methods, Atomic Absorption Spectrophotometry (AAS)

Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 22nd Edition

Test Methods for Evaluating Solid Wastes, Vol 1A, USEPA, Third Edition

CRL Environmental Corporation

• Sales Office: Unit 609 Cityland 10 Tower I * 6815 H.V. dela Costa, Ayala Ave., North, * Makati City, Philippines 1226
Tel: (632) 849-4070; (632) 811-5367 * Fax: (632) 816-8529 * E-mail: sales@crlinfo.com * http://www.crlinfo.com

• Laboratory: Bldg. 2, Bonbuglid Compound 1, Bonbuglid Ind. Subdivision, Park
Ave Area Bonbon Ave., CPZ Pampanga, Philippines
Tel: (6345) 599-3943 * (6345) 499-4328 * (632) 752-5186 * Fax (6345) 599-3942

Certified by:

Ronald M. Espiritu
PRC License No.: 9218
Chemical Testing

Date: 09/05/14

Juliana C. Oriña
PRC License No.: 8774
Chemical Testing

Date: 9/8/14

Chas C. Arroyo
PRC License No.: 8731
Chemical Testing

Date:

Disclaimer: This report pertains only to the samples investigated and does not necessarily apply to other apparently identical or similar materials. This report is submitted for the exclusive use of the client to whom it is addressed. Any reproduction of this report or use of the Laboratory's name for advertising or publicity purposes without authorization is prohibited. This analytical report is NOT VALID without the official ink seal of CRL Environmental Corporation.

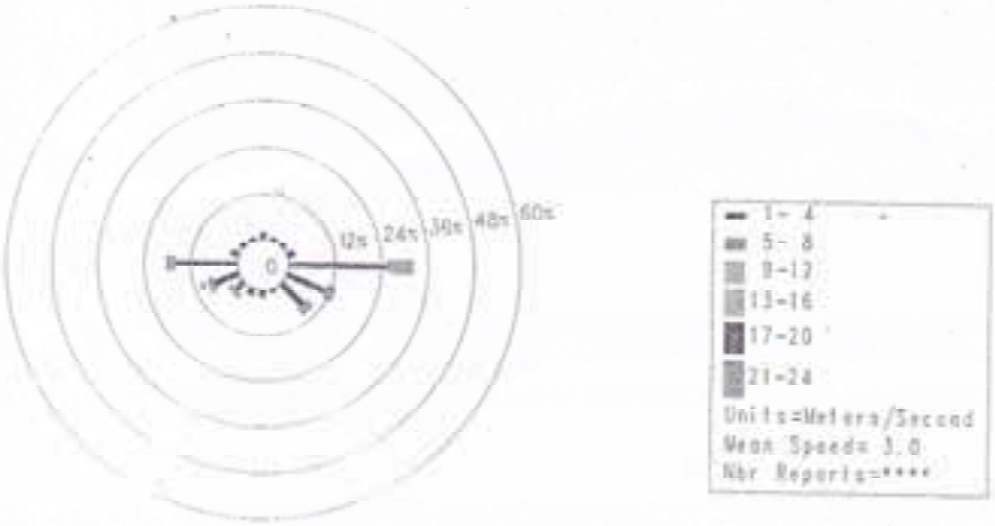
CRL Environmental Corporation

• Sales Office: Unit 609 Cityland 10 Tower I, 6815 H.V. dela Costa, Ayala Ave., Makati City, Philippines 1229
Tel. (632) 840-4870, (632) 811-4367 • Fax (632) 816-0729 • E-mail: info@crlphils.com • http://www.crlphils.com
• Laboratory: Bldg. 7, Berthaphil Compound 1, Berthaphil Inc. Industrial Park
New Aniod Avenue, CPZ Pampanga, Philippines
Tel. (6345) 599-7943 • (6345) 899-4529 • (632) 811-4367 • Fax (6345) 599-7943

WIND ROSE DIAGRAM, 1971-1999

NAIA (MIA)

Annual



FREQUENCY TABLE

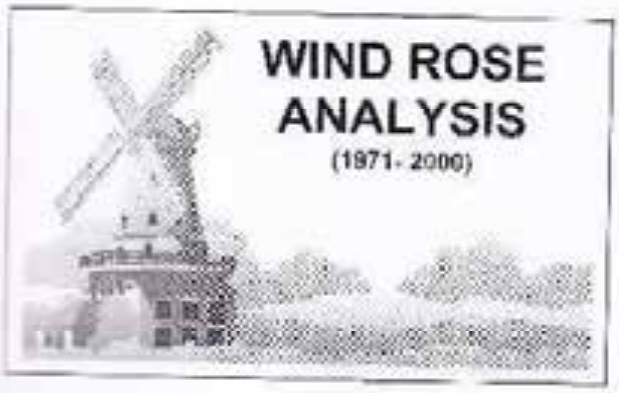
NAIA (MIA), Pasay City

Wind Speed and Direction

Annual (1971-1999)

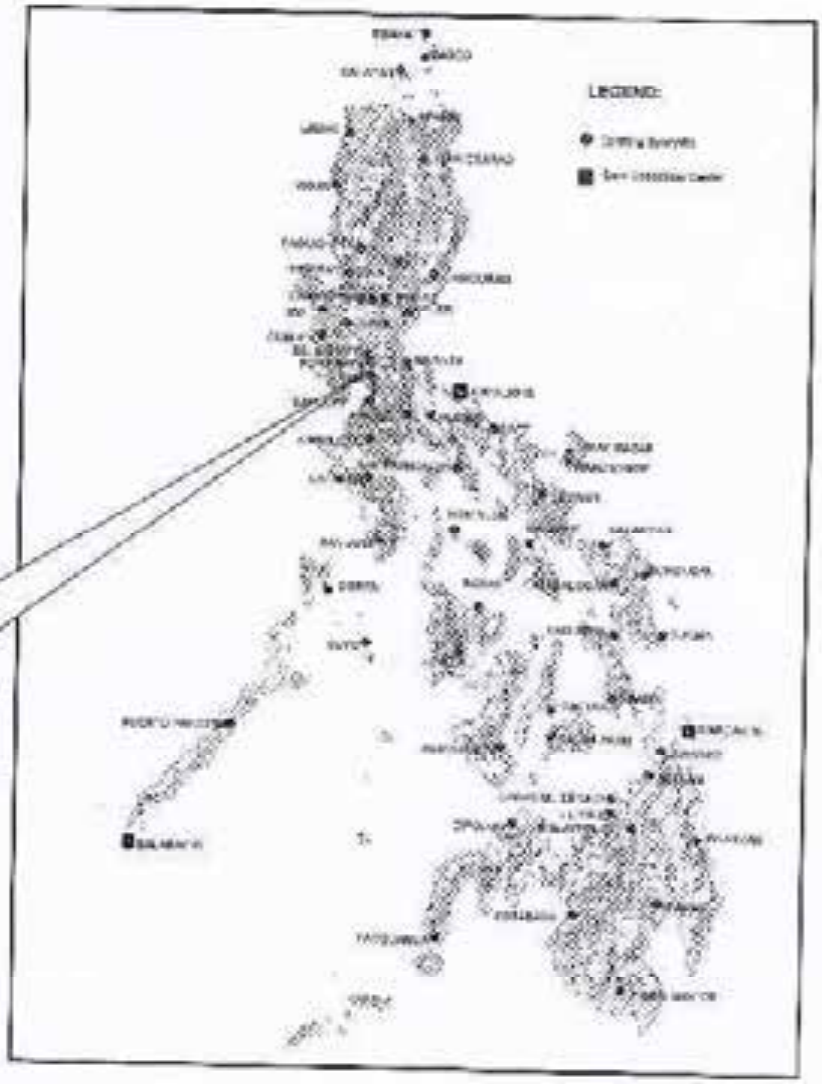
Direction / Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE
CALM								
1 - 4	1.8	1.2	1.0	2.4	25.8	11.0	7.9	0.9
5 - 8	0.1	0.0	0.1	0.1	6.2	2.1	1.6	0.0
9-12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	1.9	1.2	1.1	2.5	32	13.1	9.5	0.9

Direction / Speed (mph)	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM									0.2
1 - 4	2.2	1.6	2.6	6.9	15.9	2.4	0.9	0.9	85.4
5 - 8	0.1	0.2	0.6	1.2	1.6	0.1	0.1	0.1	14.2
9-12	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.2
>12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	2.3	1.8	3.3	8.1	17.6	2.5	1.0	1.0	100



WIND ROSE ANALYSIS

(1971- 2000)



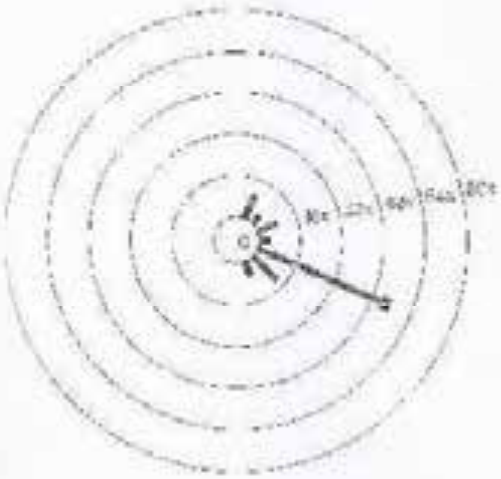
NAIA (MIAL PASAY CITY

January, 2013
Climate and Agrimet Data Section
Meteorology & Agrometeorology Division

WIND ROSE DIAGRAM, 1971-2000

NAIA (MIA)

January





FREQUENCY TABLE

NAIA, Pasay, City

Wind Speed and Direction

January (1971-2000)

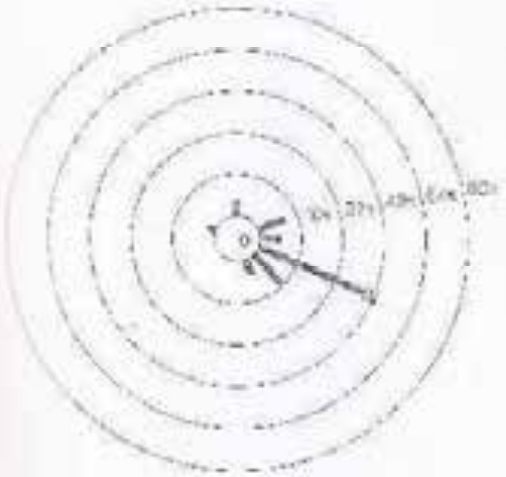
Direction / Speed (mps)	N	NNE	NE	ENE	E	ESE	SE	SSE
CALM								
1-4	1.8	2.0	1.5	3.2	45.3	20.4	6.8	0.3
5-8	0.0	0.1	0.2	0.1	4.2	2.4	0.7	0.1
9-12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	1.8	2.1	1.7	3.3	49.5	22.8	7.6	0.4

Direction / Speed (mps)	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM									0.1
1-4	0.8	0.2	0.2	0.6	5.6	1.9	0.6	0.6	91.9
5-8	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	8.0
9-12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.9	0.2	0.2	0.6	5.7	1.9	0.6	0.6	100.0

WIND ROSE DIAGRAM, 1971-2000

NAIA (MIA)

February





FREQUENCY TABLE

NAIA, Pasay, City

Wind Speed and Direction

February(1971-2000)

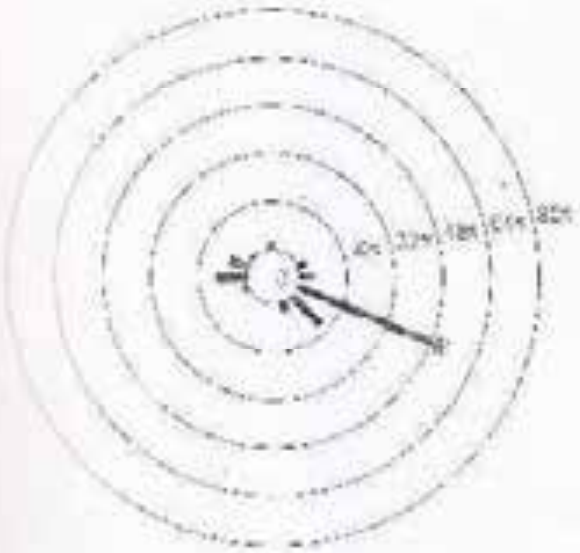
Direction / Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE
CALM								
1-4	1.1	0.4	0.4	2.9	37.0	20.6	11.5	0.6
5-8	0.1	0.0	0.1	0.4	11.6	4.6	2.0	0.0
9-12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	1.2	0.4	0.5	3.3	48.6	25.2	13.5	0.5

Direction / Speed (mph)	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM									0.0
1-4	0.8	0.2	0.1	0.2	3.1	1.5	0.5	0.2	81.2
5-8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.8
9-12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.8	0.2	0.1	0.2	3.1	1.5	0.5	0.2	100.0

WIND ROSE DIAGRAM, 1971-2000

NAIA (MIA)

March





FREQUENCY TABLE

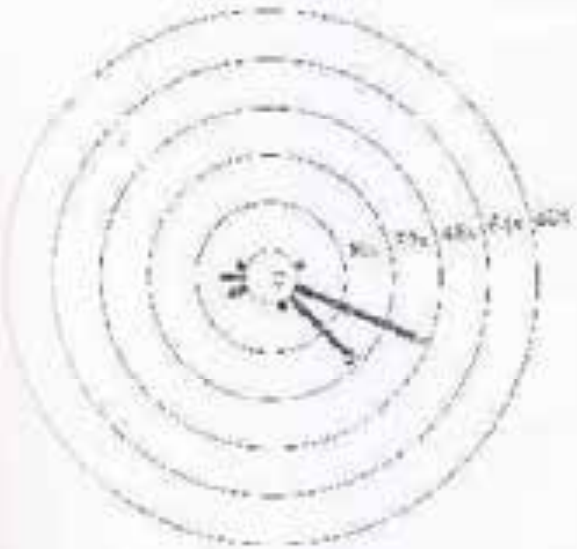
NAIA, Pasay, City
Wind Speed and Direction
March (1971-2000)

Direction / Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE
CALM								
1-4	1.2	0.6	0.0	0.9	32.8	18.9	11.4	0.5
5-8	0.0	0.1	0.0	0.3	19.6	4.9	4.8	0.0
9-12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	1.2	0.6	0.0	1.2	52.1	23.8	16.2	0.5

Direction / Speed (mph)	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM									0.1
1-4	0.4	0.1	0.0	0.5	2.2	0.6	0.2	0.2	70.2
5-8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.6
9-12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.4	0.1	0.0	0.5	2.2	0.6	0.2	0.2	100.0

WIND ROSE DIAGRAM, 1971-2000

NAIA (MIA)
April





FREQUENCY TABLE

NAIA, Pasay, City
Wind Speed and Direction
April (1971-2000)

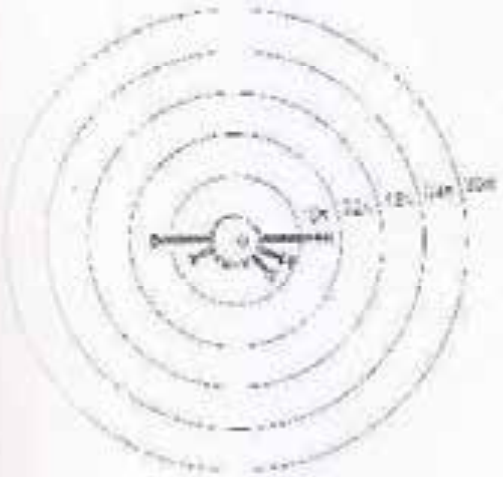
Direction / Speed (mps)	N	NNE	NE	ENE	E	ESE	SE	SSE
CALM								
1-4	0.3	0.2	0.1	0.6	24.6	20.9	11.0	0.6
5-8	0.1	0.0	0.1	0.1	18.8	4.8	5.5	0.0
9-12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.4	0.2	0.2	0.7	43.6	25.7	16.5	0.6

Direction / Speed (mps)	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM									0.0
1-4	1.4	0.6	0.3	2.3	5.7	0.8	0.3	0.3	70.4
5-8	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	29.6
9-12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	1.4	0.6	0.3	2.3	5.9	0.8	0.3	0.3	100.0

WIND ROSE DIAGRAM, 1971-2000

NAIA (MIA)

May





FREQUENCY TABLE

NAIA, Pasay, City
Wind Speed and Direction
May (1971-2000)

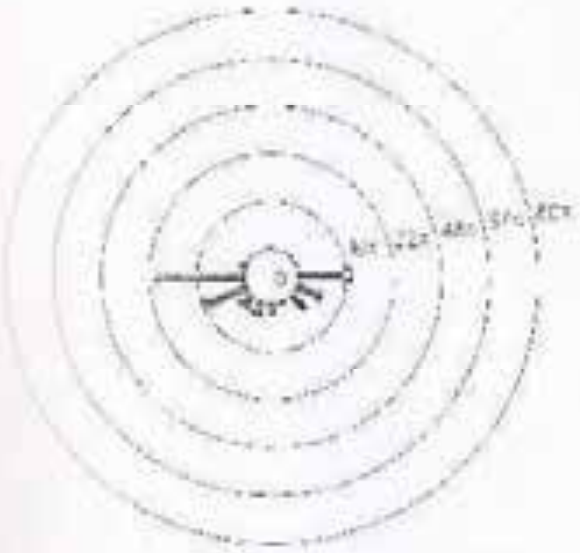
Direction / Speed (mps)	N	NNE	NE	ENE	E	ESE	SE	SSE
CALM								
1-4	3.6	0.2	0.2	0.8	17.5	10.3	9.1	1.0
5-8	0.0	0.0	0.0	0.0	9.7	4.7	2.8	0.0
8-12	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.6	0.2	0.2	0.8	27.2	15.0	11.8	1.0

Direction / Speed (mps)	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM									0.1
1-4	1.6	1.9	2.3	9.0	20.9	1.5	0.5	0.5	78.6
5-8	0.0	0.2	0.4	1.0	1.9	0.1	0.0	0.0	20.8
8-12	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.4
13-16	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	1.6	2.0	3.1	10.0	22.8	1.6	0.5	0.5	100.0

WIND ROSE DIAGRAM, 1971-2000

NAIA (MIA)

June





FREQUENCY TABLE

NAIA, Pasay, City

Wind Speed and Direction

June (1971-2000)

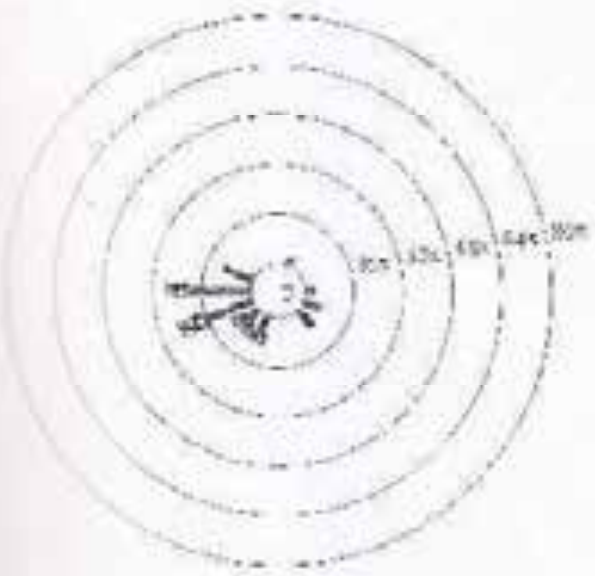
Direction / Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE
CALM								
1-4	0.6	0.1	0.6	0.8	15.0	7.5	7.1	1.4
5-8	0.1	0.0	0.1	0.0	2.5	0.6	0.0	0.0
9-12	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.7	0.1	0.7	0.8	17.5	8.1	7.2	1.4

Direction / Speed (mph)	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM									0.1
1-4	3.0	3.9	4.4	13.3	29.2	1.7	0.7	0.5	90.3
5-8	0.3	0.6	0.8	2.1	2.3	0.2	0.0	0.0	9.4
9-12	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.2
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	3.3	4.5	5.2	15.4	31.6	1.9	0.7	0.5	100.0

WIND ROSE DIAGRAM, 1971-2000

NAIA (MIA)

July





FREQUENCY TABLE
NAIA, Pasay, City
Wind Speed and Direction
July (1971-2000)

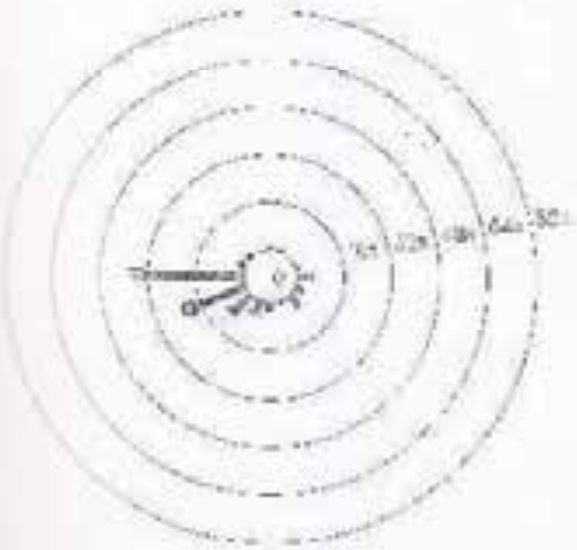
Direction / Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE
CALM								
1-4	0.4	0.9	0.9	0.2	8.9	3.8	5.1	1.5
5-8	0.2	0.0	0.0	0.0	0.4	0.1	0.4	0.1
9-12	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.6	0.9	0.9	0.2	9.3	4.0	5.6	1.6

Direction / Speed (mph)	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM									0.1
1-4	4.0	4.1	7.2	16.5	28.1	2.6	0.7	0.7	85.8
5-8	0.1	0.5	2.0	4.3	5.2	0.0	0.1	0.1	13.5
9-12	0.0	0.0	0.1	0.3	0.1	0.0	0.0	0.0	0.6
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	4.1	4.6	9.3	21.2	33.4	2.6	0.8	0.8	100.0

WIND ROSE DIAGRAM, 1971-2000

NAIA (MIA)

August



FREQUENCY TABLE

NAIA, Pasay City

Wind Speed and Direction

August (1971-2000)

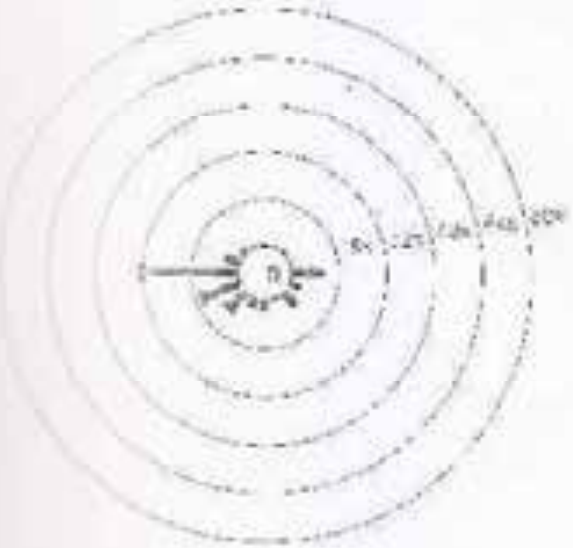
Direction / Speed (mps)	N	NNE	NE	ENE	E	ESE	SE	SSE
CALM								
1-4	0.9	0.9	0.3	1.0	5.8	3.0	4.9	0.6
5-8	0.0	0.0	0.1	0.0	0.3	0.1	0.1	0.0
9-12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.9	0.9	0.4	1.0	6.1	3.1	5.0	0.6

Direction / Speed (mps)	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM									0.1
1-4	2.2	3.7	8.2	18.3	33.3	2.5	0.7	0.4	86.5
5-8	0.3	0.6	1.4	4.4	5.5	0.2	0.1	0.0	13.1
9-12	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.3
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	2.5	4.3	9.7	22.8	38.9	2.5	0.8	0.4	100.0

WIND ROSE DIAGRAM, 1971-2000

NAIA (MIA)

September





FREQUENCY TABLE

NAIA, Pasay, City
Wind Speed and Direction
September (1971-2000)

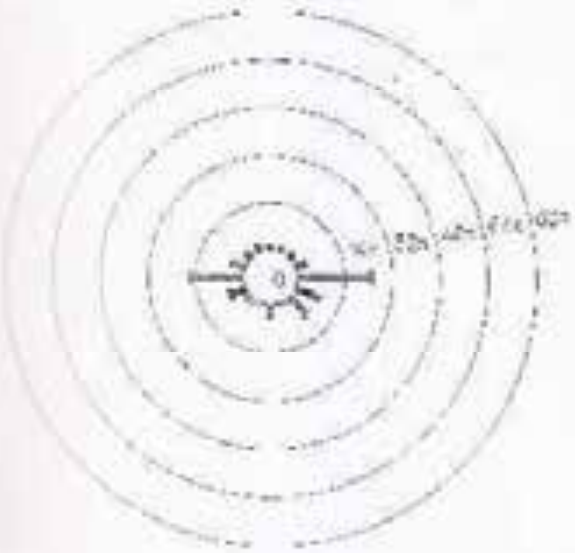
Direction / Speed (mps)	N	NNE	NE	ENE	E	ESE	SE	SSE
CALM								
1-4	1.3	0.9	0.6	1.3	10.9	4.0	5.8	0.8
5-8	0.0	0.0	0.0	0.1	0.3	0.1	0.2	0.1
9-12	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	1.3	0.9	0.6	1.4	11.2	4.3	6.0	1.0

Direction / Speed (mps)	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM									0.0
1-4	4.4	3.1	6.6	13.3	31.2	5.5	1.6	1.5	92.9
5-8	0.0	0.1	1.5	1.0	2.5	0.1	0.1	0.4	6.8
9-12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	4.4	3.2	8.1	14.3	33.7	5.6	1.7	1.9	100.0

WIND ROSE DIAGRAM, 1971-2000

NAIA (MIA)

October





FREQUENCY TABLE

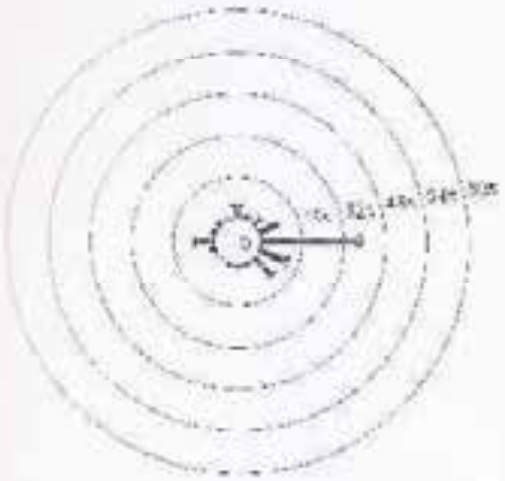
NAIA, Pasay, City
Wind Speed and Direction
October (1971-2000)

Direction / Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE
CALM								
1-4	2.4	1.8	1.9	4.0	24.4	9.5	8.1	1.1
5-8	0.1	0.0	0.0	0.0	0.0	0.4	0.6	0.0
9-12	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	2.6	1.8	1.9	4.0	25.4	9.9	8.7	1.1

Direction / Speed (mph)	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM									0.4
1-4	4.7	1.2	1.5	5.0	16.8	8.0	2.4	2.8	91.5
5-8	0.2	0.0	0.5	1.5	0.5	0.2	0.0	0.3	5.2
9-12	0.0	0.0	0.2	0.0	0.3	0.1	0.0	0.0	0.8
13-16	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	4.9	1.2	2.2	6.5	17.9	8.3	2.4	3.1	100.0

WIND ROSE DIAGRAM, 1971-2000

NAIA (MIA)
November





FREQUENCY TABLE
NAIA, Pasay, City
Wind Speed and Direction
November (1971-2000)

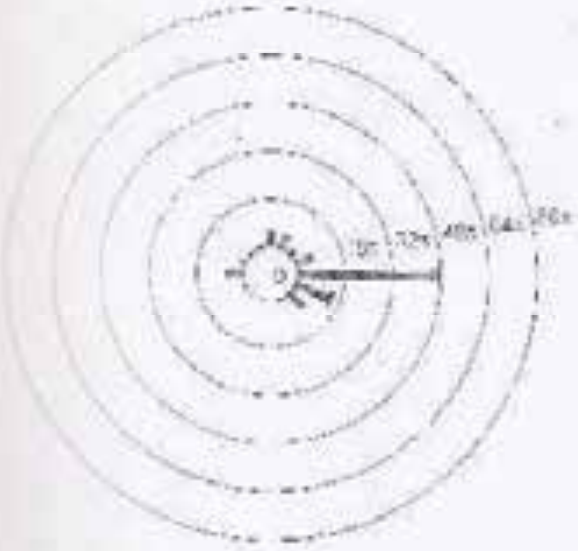
Direction / Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE
CALM								
1-4	5.6	2.2	4.2	8.4	36.8	10.7	9.2	0.6
5-8	0.8	0.0	0.2	0.0	1.8	0.7	0.8	0.0
8-12	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	6.4	2.2	4.4	8.4	38.7	11.6	10.0	0.9

Direction / Speed (mph)	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM									0.1
1-4	1.4	0.7	0.3	1.0	5.6	2.3	1.4	1.4	93.2
5-8	0.1	0.1	0.1	0.6	0.8	0.1	0.1	0.2	5.6
8-12	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.3
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	1.5	0.8	0.4	1.6	7.4	2.4	1.6	1.6	100.0

WIND ROSE DIAGRAM, 1971-2000

NAIA (MIA)

December



FREQUENCY TABLE

NAIA, Pasay, City

Wind Speed and Direction

December (1971-2000)

Direction / Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE
CALM								
1-4	6.2	4.9	2.1	5.5	45.5	11.9	6.3	0.8
5-8	0.2	0.1	0.2	0.0	3.1	1.2	0.3	0.0
8-12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	6.4	5.0	2.3	5.5	48.6	13.1	6.6	0.8

Direction / Speed (mph)	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
CALM									0.1
1-4	0.4	0.0	0.3	0.8	5.9	2.2	0.7	1.1	94.4
5-8	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.1	5.5
8-12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13-16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
>16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0.4	0.0	0.3	0.8	6.0	2.2	0.9	1.2	100.0

MALACAÑANG

RESIDENCE OF THE PRESIDENT
OF THE PHILIPPINES
MANILA

BY THE PRESIDENT OF THE PHILIPPINES

PROCLAMATION No. 41

RESERVING FOR NATIONAL PARK PURPOSES TO BE KNOWN AS "MANILA BAY BEACH RESORT" A CERTAIN PARCEL OF THE PUBLIC DOMAIN SITUATED IN THE CITIES OF MANILA AND PASAY AND THE MUNICIPALITY OF PARAÑAQUE, PROVINCE OF RIZAL, ISLAND OF LUZON

Upon the recommendation of the Secretary of Agriculture and Natural Resources as Chairman of the Commission on Parks and Wildlife, and pursuant to the provisions of section one of Act Numbered Thirty-nine hundred and fifteen, as amended, and of scetion two of Republic Act Numbered Eight hundred and twenty-six, I, Ramon Magsaysay, President of the Philippines, do hereby withdraw from sale or settlement and reserve for national park purposes to be known as "Manila Bay Beach Resort" under the administration of the Commission on Parks and Wildlife, subject to private rights if any there be, the following parcel of land of the public domain, situated in the cities of Manila and Pasay and the municipality of Parañaque, Province of Rizal, Island of Luzon, and more particularly described as follows, to wit:

Beginning at a point marked 1 on plan N. P. No. 34 being S. 40° 48' W., 86.24 meters from M.B.M. 1, Pasay Cadastre 259, thence N. 12° 52' W., 727.26 meters to point 2; thence N. 15° 10' W., 843.48 meters to point 3; thence N. 17° 34' W., 288.63 meters

to point 4; thence N. 21° 36' W., 224.00 meters to point 5; thence N. 27° 37' W., 216.00 meters to point 6; thence S. 61° 24' W., 1,028.00 meters to point 7; thence S. 14° 15' E., 1,200.00 meters to point 8; thence S. 14° 04' E., 718.00 meters to point 9; thence S. 9° 02' E., 1,200.00 meters to point 10; thence S. 8° 00' E. 344.00 meters to point 11; thence S. 2° 14' E., 728.00 meters to point 12; thence S. 87° 26' E., 1,019.99 meters to point 13; thence N. 0° 24' W., 352.00 meters to point 14; thence N. 7° 06' W., 1,200.00 meters to point 15; thence N. 6° 36' W., 867.00 meters to point 16; thence N. 9° 14' W., 586.42 meters to the point of beginning. Bounded on the North, by Manila Bay; on the east, by Dewey Boulevard; and on the south and west, by Manila Bay. Containing an approximate area of 4,646,612 square meters, more or less.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the seal of the Republic of the Philippines to be affixed.

Done in the City of Manila, this 5th day of July, in the year of Our Lord, nineteen hundred and fifty-four, and of the Independence of the Philippines, the ninth.

[SEAL]

RAMON MAGSAYSAY
President of the Philippines

By the President:

FRED RUIZ CASTRO
Executive Secretary

MEMORANDUM OF AGREEMENT
ON THE CREATION OF THE
MULTI-PARTITE MONITORING TEAM,
ENVIRONMENTAL MONITORING FUND
AND THE ENVIRONMENTAL GUARANTEE FUND FOR THE
PROPOSED PASAY CITY RECLAMATION PROJECT

KNOW ALL MEN BY THESE PRESENTS:

This Memorandum of Agreement is made and entered into this _____day of _____, at _____ by and among:

The **DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES**, through the **ENVIRONMENTAL MANAGEMENT BUREAU** (EMB) with principal office at EMB, Bldg., DENR Compound, Visayas Avenue, Diliman, Quezon City, represented by its Director, **JUAN MIGUEL T. CUNA**, hereinafter referred to as **EMB**;

-And-

The **Pasay City Government,** with principal office at Pasay City, represented by its City Mayor, **Hon. Antonino G. Calixto,** hereinafter referred to as **Pasay City Government**

WITNESSETH, That:

WHEREAS:

(i) Pursuant to Presidential Decree No. 1586, **Pasay City Government** has been issued an Environmental Compliance Certificate (ECC) with ECC Reference Code No. xxxx dated xxxx, xxxxx, 2013 for its Proposed **Pasay City Reclamation Project**, located at Barangay 78 Zone 10, Pasay City, hereinafter referred to as the PROJECT;

(ii) The ECC for the Project requires, as a condition, the formation of a Multi-partite Monitoring Team, hereinafter referred to as MMT, which shall be composed of representatives of the DENR, Pasay City Government, Pasay City, the Philippine Reclamation Authority, Non-Government Organization (NGO)/People's Organization (PO) and the affected communities/vulnerable groups. The MOA shall be submitted to this Office for approval within sixty (60) days from receipt of this ECC".

(iii) The ECC for the Project requires, as a condition, the establishment of an **Environmental Guarantee Fund**, hereinafter referred to as **EGF**, as a fund source for the indemnification of damages caused by the PROJECT and immediate rehabilitation and/or restoration of affected ecosystems, and **Environmental Monitoring Fund**, hereinafter referred to as **EMF**, to cover the expenses of environmental monitoring and surveillance activities;

(iv) The Parties desire to clarify and thus define hereunder their respective commitments and responsibilities in connection with the formation of the MMT and the establishment of the EGF and EMF;

NOW, **THEREFORE**, for and in consideration of the foregoing premises and the mutual covenants set forth herein, the Parties hereto agree as follows:

TITLE I. THE MMT ORGANIZATION

SECTION A. COMPOSITION

The following shall be represented in the MMT:

1. DENR EMB-NATIONAL CAPITAL REGION
2. PASAY CITY GOVERNMENT
3. BARANGAY 78, Zone 10
4. Accredited NGO/PO
5. PHILIPPINE RECLAMATION AUTHORITY
6. Philippine Coast Guard (PCG)
7. MANILA BAY COUNCIL

SECTION B. MMT STRUCTURE AND LEADERSHIP

The following shall serve as the MMT Organizational Structure:
MMT Executive Committee:

1) DENR-EMB NCR- Regional Director - Chairman
2) Proponent – Pasay City Government – Vice Chairman
3) Mayor of Pasay City
4) PHILIPPINE RECLAMATION AUTHORITY
5) MANILA BAY COUNCIL

Sectoral Monitoring Teams (SMT):

1) DENR PENRO
2) DENR - EMB NCR
3) DENR CENRO
4) Pasay City
5) NGO/PO
6) Barangay Chairmen: Brgy. 78, Zone 10, Pasay City
7) PCG

MMT Secretariat

1) DENR-EMB NCR
2) Proponent – Pasay City Government

SECTION C: MEMBERSHIP

The MMT shall be multi-sectoral and shall have representations from the stakeholders as identified in Section A above. The identified offices / sector shall officially designate/authorize through a written office order, endorsement letter or similar instruments, a representative to be a member of the MMT who must:

1. Be able to regularly attend meetings, orientations, training, actual monitoring and reporting activities.
2. Be able to read, write and learn the various aspects of monitoring.
3. Be credible to the larger community and without any criminal or administrative cases

The EMB shall confirm and update the official listing of MMT Members.

TITLE II. MMT FUNCTIONS, INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES

SECTION A. MAJOR FUNCTIONS OF THE MMT

Functions of MMT are as follows:

1. Monitor project compliance with the conditions stipulated in the ECC (**Annex A**) and the EMP (**Annex B**);
2. Validate proponent's conduct of self monitoring
3. Receive complaints, gather relevant information to facilitate determination of validity of complaints or concerns about the project and timely transmit to the proponent and EMB recommended measures to address the complaint
4. Prepare, integrate & disseminate simplified monitoring reports to community stakeholders
5. Make regular and timely submission of MMT Report based on the EMB-prescribed format

SECTION B. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES

The EMB NCR shall be responsible for taking the lead in policy guidance, resolution of issues where consensus or decisions cannot be made at the regional level, the provision of needed support for the operationalization of the MMT and MMT Performance validation.

Other member offices/sector identified in Section A of Title I as needing representation in the MMT shall have the following roles, duties and responsibilities:

DENR-EMB NCR, with the assistance of **the DENR-PAWB** is in charge of the areas/site hosting the Project and shall lead the SMT in undertaking actual monitoring activities and act with dispatch on issues/problems that arise relative to the PROJECT being monitored.

PASAY CITY GOVERNMENT shall provide necessary budget/funds for the MMT activities, make available to the MMT all project information necessary to determine compliance with the environmental requirements and commitments to the extent that such information is not subject to any restrictions and confidentiality, coordinate with and allow the MMT members to inspect and observe construction and operation activities of the PROJECT including the testing, calibration and operation of pollution control and in-house monitoring equipment.

NGO/PO shall designate a representative who shall participate in actual monitoring work, prepare or concur with and sign the monitoring reports, provide the necessary information such as update regarding the perceptible impact of the project on the sector/concern being represented.

PCG shall monitor the progress of project implementation through the MMT and provide advice on the marine regulation requirements; coordinate its agency's role in assisting **Pasay City Government** and its contractors in the project implementation specially in regulating navigation related activities at or around the Project to avoid environmental damage, including but not limited to, the declaration and enforcement of reasonable safety and exclusion zones.

PRA shall provide technical assistance and advice, based on their technical expertise and experience in the energy industry, on environmental management and standards of similar or comparable installations (local and international) as the Project.

TITLE III. MMT OPERATIONS AND PROCEDURES

SECTION A. MMT MANUAL OF OPERATIONS

All MMT activities shall be guided by a Manual of Operations (MOO) to be prepared based on the EMB-prescribed generic manual of operations which shall be customized based on the project type/situation and the corresponding monitoring requirements and submit to EMB-NCR for approval within sixty (60) days from the signing of this MOA. The MOO shall contain, at the minimum, the following:

MMT Code of Ethics

I. INTRODUCTION
II. PROJECT BACKGROUND
III. LEGAL BASIS
IV. VISION-MISSION
V. OBJECTIVES
VI. GENERAL FUNCTIONS
VII. MEMBERSHIP
- 7.1 Selection Process and Criteria for Membership
- 7.2 Suspension/Removal, Resignation and Replacement of Members

VIII. ORGANIZATION
- 8.1 MMT Structure and leadership
- 8.2 General Roles, Duties And Responsibilities Of MMT Members
- 8.3 Specific Roles, Duties And Responsibilities Of MMT Members

IX. FUND ADMINISTRATION AND MANAGEMENT
- 9.1 Amount of EMF
- 9.2 Utilization of EMF / Preparation of a Work and Financial Plan
- 9.3 Management of the Fund
- 9.4 Disbursement and Auditing Procedures

X. ACTIVITIES AND CORRESPONDING GUIDELINES
- 10.1 Meetings
  - 10.1.1 Regular Meetings
  - 10.1.2 Special Meetings
  - 10.1.3 Notice of Meetings
  - 10.1.4 Quorum
  - 10.1.5 Proxy Voting
- 10.2 Compliance Monitoring, Site Validation and Reporting
  - 10.2.1 Document Review – ECC & EMP Commitments, EIA Predictions, Previous and Current Monitoring Reports
  - 10.2.2 Site Validation
  - 10.2.3 Confirmatory Sampling and Measurement Activities
  - 10.2.4 Complaint Verification and Management
  - 10.2.5 Reporting – Compliance Monitoring and Validation Report
- 10.3 Records Keeping
- 10.4 Public Disclosure and IEC
- 10.5 Other MMT Operations Enhancement Activities
  - 10.5.1 Review of Proponent's Monitoring Protocols
  - 10.5.2 MMT Performance Validation
  - 10.5.3 Annual Planning Workshop
  - 10.5.4 Trainings

The MOO may be updated as the need arises to address operational problems and for continuous improvement of the MMT operations.

SECTION B. ESTABLISHMENT OF THE ENVIRONMENTAL MANAGEMENT FUND (EMF)

The EMF is a fund that the proponent shall commit to establish to support the activities of the MMT as described in the EMB-approved Annual Work and Financial Plan (AWFP).

Pasay City Government shall arrange the opening of an account in a reputable bank in the country for the EMF within ten (10) banking days after the effectivity of this Agreement, the amount of ONE HUNDRED THOUSAND PESOS to finance the initial organizational activities of the MMT for the PROJECT based on the attached Work and Financial Plan (**Annex C**).The Interest shall accrue to the same fund. The proponent shall replenish the account whenever it falls below ONE HUNDRED THOUSAND PESOS (PHP 100,000) within thirty (30) days, provided that the total amount expended by Pasay City Government shall not exceed PhP 400,000.00 for the entire duration of the initial organizational activities specified in Annex "C".

The succeeding MMT monitoring activities shall be covered by a separate work and financial plan with a replenishable budget approved by the MMT Exec Com.

SECTION C. EMF ADMINISTRATION AND MANAGEMENT

The EMF shall be exclusively utilized to cover all costs attendant to the operation of the MMT and disbursed in accordance with the guidelines stipulated in the approved MOO. The EMF shall be managed and administered by the proponent in accordance with the MMT MOO and annual work and financial plan.

A separate bank account for the EMF shall be established. The signatories shall be the designated MMT Chairman and Vice-chairman

The MMT Secretariat shall undertake the accounting of all expenses by the MMT which the Exec Com / Officers shall oversee.

An external auditor may be commissioned by the MMT, proponent or EMB to conduct audit on the expenditure/disbursement of EMF in accordance with applicable rules and guidelines.

SECTION D. DOCUMENTATION, REPORTING AND RECORDS KEEPING

All MMT activities shall be documented and a report following the EMB-prescribed format shall be submitted semi-annually to EMB Central Office (CO) and the EMB RO. The MMT shall document relevant data, technical references and compile monitoring reports and store them at the proponent's office, under the custody of the proponent's Pollution Control Officer.

TITLE IV. ENVIRONMENTAL GUARANTEE FUND (EGF)

SECTION A. OBJECTIVE

The EGF shall be established and used exclusively for the following purposes:

1. The immediate rehabilitation of areas affected by damages to the environment and the resulting deterioration of environmental quality as a direct consequence of project construction, operation and abandonment;
2. The just compensation of parties and communities affected by the negative impacts of the PROJECT;

3. The conduct of scientific or research studies related to the PROJECT that will aid in the prevention or rehabilitation of accidents and/or environmental damages; and
4. For contingency clean-up activities, environmental enhancement measures, damage prevention programs and social equity measures (e.g. livelihood, social development programs) including the necessary IEC and capability building activities related to the PROJECT.

SECTION B. ESTABLISHMENT OF EGF

There shall be two (2) components of the EGF as follows:

1.1 EGF Trust Fund

The Pasay City Government shall open an account for the Trust Fund in the amount of THREE HUNDRED THOUSAND PESOS (PhP 300,000.00) at the commencement of construction works for the reclamation. This amount shall be in the form of cash through time deposit, the earnings/interests of which shall accrue to the same Fund. The Trust Fund will be used to compensate aggrieved parties for any damages to life or property, undertake community-based environmental programs, conduct environmental research aimed at strengthening measures to prevent environmental damage and to finance restoration and rehabilitation of environmental quality of the project-affected area.

Upon commercial operation of the reclamation, the amount in the EGF trust fund shall be increased to Php 500,000.00. The Trust Fund shall be replenished annually or whenever the amount goes below Php TWO HUNDRED FIFTY THOUSAND (PhP 250,000.00). The Trust Fund shall also be renewed upon every expiration. The proponent shall immediately inform EMB Central and RO should it fail to renew the Trust Fund (e.g. insurance policy) on its stated expiration date or should the Trust Fund be cancelled or voided by the Insurer because of non-payment of the required premiums or any other cause allowed by the Insurance Code or pertinent issuances of the Insurance Commission.

1.2 EGF Cash Fund

The Pasay City Government shall open an account for the Environmental Guarantee Cash Fund at a reputable bank in the area in the amount of THREE HUNDRED THOUSAND PESOS upon the commencement of construction works for the reclamation. This amount shall be earmarked for immediate rehabilitation and compensation of affected communities in case of damage or accidents. This Cash Fund shall be placed in an interest-bearing account and such interest shall accrue to the same Cash Fund.

Upon commercial operation of the reclamation, the EGF cash fund shall be increased to Php FIVE HUNDRED THOUSAND PESOS (PhP 500,000.00).The Fund shall be replenished to this amount annually or whenever the amount goes below Php TWO HUNDRED FIFTY THOUSAND (PhP 250,000.00) .

Provided, further that in the event of insufficiency of both the EGF Trust Fund and the EGF Cash Fund to answer for expenses, the Proponent shall shoulder the amount of any such insufficiency.

SECTION C. EGF ADMINISTRATION AND MANAGMENT

An EGF Committee shall be established for EGF Management and Administration. It shall be composed of the MMT Executive Committee or Officers with the EMB Regional Director as the Chairperson.

The Chairperson of the EGF Committee shall not vote on any matters except to break a tie. Any determination or approval by the EGF Committee shall require a majority vote, provided there is a quorum. A quorum shall require the presence of more than half of the members including, at all times, the representatives from the DENR and the Proponent.

The Committee shall have the following functions:

- Manage, control and operate the EGF in accordance with approved procedures established regarding the mechanisms for fund disbursement, processing, validation, accounting and documentation;
- Resolve issues involving rehabilitation and compensation for damages that may be brought before it;
- Decide on issues or complaints/questions involving the implementation of the rehabilitation program between the proponent and the aggrieved party;
- Designate entities or individuals in the event that an independent body must resolve the issues and cases;
- Hire credible experts, when necessary, to conduct independent studies and research on the environmental and socio-cultural impacts of the PROJECT in order to assist the EGF Committee in making judicious decisions about environmental issues related to the PROJECT; and
- Undertake damage preventive and social equity measures.

Existing EMB guidelines on fund disbursement, processing, validation, accounting and documentation shall be implemented.

TITLE V. AMENDMENTS

Amendment - This Agreement may not be renewed, extended, amended or otherwise modified except by agreement in writing signed by both parties.

TITLE VI. EFFECTIVITY AND DURATION

Effectivity and Duration - This Agreement shall take effect immediately and shall be maintained by the Parties hereto (or their respective successors or assigns) until the transfer of ownership of the Project by the Pasay City Government or the abandonment or termination of the PROJECT for whatever reason. Upon such transfer, abandonment or termination of the PROJECT, all funds set up by the Proponent under this Agreement shall automatically revert to the Pasay City Government, except to the extent necessary to satisfy any outstanding obligations of the Pasay City Government under this Agreement including the financing of the rehabilitation, restoration, decommissioning or other such activities as may be required for the abandonment phase relative to the PROJECT.

IN WITNESS WHEREOF, the parties hereto have signed and executed this Agreement as of the date and place first above written.

PASAY CITY GOVERNMENT

By:

Hon. Antonino Calixto
City Mayor

ENVIRONMENTAL MANAGEMENT BUREAU (EMB)

By:

Atty. Juan Miguel Cuna
Director – EMB

WITH OUR CONFORMITY

MAYOR, PASAY CITY

By:

ANTONINO CALIXTO

PHILIPPINE RECLAMATION AUTHORITY

By:

PETER ANTHONY A. ABAYA

BARANGAY

By:

NGO/PO

By:

WITNESSES

DENR- REGION IVA

By:

Officer (PENRO)

By:

DENR REGION IVA

By:

ACKNOWLEDGMENT

REPUBLIC OF THE PHILIPPINES)
CITY OF_____) S.S.

BEFORE ME, a Notary Public for and in _____, on this_____ day of _____, at this _____, personally appeared the following:

Name and Designation	**TIN/CTC No.**	**Date & Place Issued / Expiry Date**
Atty. Juan Miguel Cuna, Director EMB	_____	_____
Hon. Antonino Calixto, City Mayor		

Known to me as the same persons who executed the foregoing Memorandum of Agreement and acknowledged the same as their free act and deed.

This Agreement consists of _____pages, including this the parties and their instrumental witnesses hereof duly signed page, and that each and every page.

WITNESS MY HAND AND SEAL on the date and at the place above written.

NOTARY PUBLIC

Doc. No. _____
Page No. _____
Book No. _____
Series of _____

Until _____
PTR No. _____
Issued at _____
on _____

Annex C

WORK PLAN TEMPLATE (MMT START UP)

No.	Function/Activities	Performance Indicator	1st QTR	2nd QTR	3rd QTR	4th QTR
1.0	Organizational Meeting, election/designation of officers /Exec Com and *Sectoral* / Committee members	Officers elected and Committees formed				
2.0	Training-Workshop on the Preparation of the MMT Manual of Operations (MOO)	MMT MOO				
3.0	Training-Workshops on the preparation and use of the customized MMT Compliance Monitoring and Validation Report (CMVR)	Customized CMVR Format for MMT Trained MMT Members on preparation of CMVR				
4.0	Preparation of Annual Work and Financial Plan (AWFP) – fully operational MMT	AWFP				
5.0	Initial Compliance Monitoring and Reporting Activities	CMVR for submission to EMB				

FINANCIAL PLAN TEMPLATE (MMT START UP)

No.	Cost Item Per activity in the work plan	Unit Cost	Qty	Days/ No	1st QTR	2nd QTR	3rd QTR	4th QTR	TOTAL
1.0	**Organizational Meetings, election/designation of officers /Exec Com and *Sectoral* / Committee members**								
1.1	Meals/venue								
1.2	Transportation Cost/ Allowance								
1.3	Materials								
2.0	**Training-Workshop on the Preparation of the MMT Manual of Operations (MOO)**								
2.1	Meals/venue								
2.2	Transportation Cost/ Allowance								
2.3	Materials								
2.4	Honoraria for Resource Persons								
3.0	**Training-Workshops on the preparation and use of the customized MMT Compliance Monitoring and Validation Report (CMVR)**								
3.1	Meals/venue								
3.2	Transportation Cost/ Allowance								
3.3	Materials								
3.4	Honoraria for								

No.	Cost Item Per activity in the work plan	Unit Cost	Qty	Days/ No	1st QTR	2nd QTR	3rd QTR	4th QTR	TOTAL
	Resource Persons								
4.0	**Preparation of the next year's Annual Work and Financial Plan (AWFP) – fully operational MMT**								
4.1	Meals/venue								
4.2	Transportation Cost/ Allowance								
4.3	Materials								
5.0	**Compliance Monitoring and Reporting Activities**								
5.1	Document Review Mtg. Meals/Venue								
5.2	Document Review Mtg. Transportation Cost/ Allowance								
5.3	Site Validation Per Diem								
5.4	Report Preparation Mtg. Meals/Venue								
5.5	Report Preparation Mtg. Transportation Cost/ Allowance								
	TOTAL								